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Vol. XXI, No. 7 JULY, 1932

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 80th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN TORONTO, CANADA, IN 1932—August 22nd–27th, Royal York Hotel, Headquarters, R. B. J. Stanbury, 43 Victoria St., Toronto 2, Canada, Local Secretary.

The 1932 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Toronto.

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CANADIAN-AMERICAN PHARMACEUTICAL CONVENTION.

Toronto, August 22nd–27th.

A joint convention of the American Pharmaceutical Association and its allied organizations with the Canadian Pharmaceutical Association, including the Ontario Retail Druggists' Association.

R. B. J. Stanbury, 43 Victoria St., *Local Secretary.*

The Convention Committee is made up of the following officers: *Honorary Chairman,* W. J. A. Carnahan; *General Chairman,* C. P. Playter; *Vice-Chairman,* C. G. Whebby; *Treasurer,* F. C. Fielding; *Secretary,* F. A. Jacobs.

The officers of the Canadian Pharmaceutical Association are: *Honorary Presidents:* Leslie G. Henderson, Vancouver; H. D. Campbell, Winnipeg; E. Clinton Brown, St. John; Harry Brodie, Moose Jaw. *President,* Dean G. A. Burbidge, Halifax; *Vice-President,* A. F. Larose, Montreal; *Chairman of Council,* A. J. Wilkinson, Windsor; *Secretary and Editor of the Journal,* R. B. J. Stanbury.

Honorary Members are: Representatives of the American Pharmaceutical Association and of the several Canadian organizations.

The letter by the General Chairman to the members of the Canadian Associations and A. Ph. A. members follows:

Dear Friend and Neighbour:

When the AMERICAN PHARMACEUTICAL ASSOCIATION members arrive in Canada for their annual convention in the coming midsummer, there awaits for you personally a hearty welcome.

The city in Canada selected by your Convention in 1928 was Toronto. This city of ours is often spoken of as the "Convention City." It has indeed been a convention point for perhaps a thousand years. The Indians held conventions here before the coming of the white man, and they gave the locality the name To-ron-to. In their language it means place of meeting.

The city is beautifully situated on the north shore of Lake Ontario, near the mouth of the historic and romantic Humber River.

In order to make certain of a large attendance, the Canadian Pharmaceutical Association of some 3000 members, and also the Ontario Retail Druggists' Association, having somewhat less than 1000 members, are holding their conventions at the same time as the A. PH. A., with their headquarters at the same hotel. But there will be no danger of overcrowding. The Royal York Hotel with its 1200 rooms is the largest hotel in the British Empire, and there have been set aside for your convention the large Convention Hall and nine salons for the meetings of the various divisions and sections.

We pharmacists of Canada will be permitted to attend your sessions, and you shall certainly be welcomed to ours, and between sessions there will be ample time to fraternize. Entertainment for each evening during the week is already planned. We have been working on the arrangements since the beginning of the year and we are looking forward to meeting you.

Be sure and come!

Faithfully and sincerely,

C. P. PLAYTER, *General Chairman.*

Ceremonies at Headquarters Site—Breaking ground for pharmaceutical building, July 1, 1932.—Lincoln Memorial in the foreground.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXI JULY, 1932 No. 7

FIRST OF THE CEREMONIES PREPARATORY TO THE ERECTION OF THE PHARMACEUTICAL BUILDING.

It became necessary to arrange hurriedly for the ceremonies of breaking ground for the construction of the Pharmaceutical Building. The shortness of time did not permit of the more extended arrangements which will be arranged for at the time of the corner-stone laying. The following program was carried out:

CEREMONIES IN CONNECTION WITH THE BREAKING OF GROUND FOR THE PHARMACEUTICAL BUILDING, WASHINGTON, D. C., FRIDAY, JULY 1, 1932.

Introductory remarks by Dr. H. A. B. Dunning, Chairman of the Building Committees in charge of the ceremonies, were followed by brief addresses by: Dr. Charles Moore, Chairman, Commission of Fine Arts; Mr. Walter D. Adams, President, AMERICAN PHARMACEUTICAL ASSOCIATION; Dr. Harry A. Fowler, President, Medical Society of the District of Columbia; Sir Henry S. Wellcome, Honorary President of AMERICAN PHARMACEUTICAL ASSOCIATION. Dr. W. Bruce Philip, President-Elect of AMERICAN PHARMACEUTICAL ASSOCIATION.

H. A. B. Dunning.

Ground was broken by Dr. S. L. Hilton, Chairman of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Others in attendance, besides those functioning in the program, were: Secretary H. P. Caemmerer, of Commission of Fine Arts; L. E. Warren, Washington, D. C.; Dr. V. K. Chesnut, Washington, D. C.; Dr. H. C. Fuller, Washington, D. C.; Mrs. Walter D. Adams, Forney, Texas; August Boas, Washington, D. C.; G. A. Bunting, Baltimore, Md.; Mr. and Mrs. Fred B. Campbell, Washington, D. C.; Mr. and Mrs. F. A. Delgado, Washington, D. C.; W. C. Downey, Washington, D. C.; Dr. and Mrs. A. G. DuMez, Baltimore, Md.; Mrs. H. A. B. Dunning, Baltimore, Md.; Miss Katherine Dunning, Baltimore, Md.; Mr. and Mrs. E. G. Eberle, Baltimore, Md.; Miss Martha Floyd, Dallas, Texas; Dr. R. P. Fischelis, Trenton, N. J.; Mr. and Mrs. Carson P. Frailey, Washington, D. C.; Dean C. J. Fuhrmann, Washington, D. C.; Mr. and Mrs. Gardiner, San Francisco, Calif.; A. F. Gorsuch, Washington, D. C.; Dr. Ida J. Heiberger, Washington, D. C.; Dr. and Mrs. S. L. Hilton, Washington, D. C.; Dr. and Mrs. Glenn L. Jenkins and daughter, Baltimore, Md.; Dr. Lyman F. Kebler, Washington, D. C.; Dr. and Mrs. J. C. Krantz, Jr., Baltimore, Md.; Dr. and Mrs. E. F. Kelly, Texas, Md.; Miss Ethel Ridgway, Washington, D. C.; Miss Minnie Low, Washington, D. C.; Mr. and Mrs. T. A. Moskey, Washington,

D. C.; Dr. E. L. Newcomb, New York City; Mrs. W. Bruce Philip, Washington, D. C.; R. L. Quigley, Washington, D. C.; Miss Quigley, Washington, D. C.; Miss Rogers, Washington, D. C.; Mr. and Mrs. W. B. Spire, Mt. Rainier, Md.; Dr. and Mrs. R. L. Swain, Baltimore, Md.; R. L. Swain, Jr., Baltimore, Md.; Mr. and Mrs. A. C. Taylor, Washington, D. C.; R. E. Lee Williamson, Baltimore, Md.; Mr. and Mrs. A. L. I. Winne, Richmond, Va.; Arthur Winne, Richmond, Va.

ADDRESS BY DR. CHARLES MOORE, CHAIRMAN OF THE NATIONAL COMMISSION OF FINE ARTS.

"Charles Dudley Warner once wrote of the young woman who was charmed by a red hat and bought it. Then she had to change her entire wardrobe to correspond with that red hat. In much the same way the creation of the noble and inspiring Lincoln Memorial has made necessary a revision of all the landscape within the sphere of its beneficent influence. Where new buildings were projects the first question was, 'How will the new structure comport with the Lincoln Memorial?'

Happily there was a well-established precedent in the row of semi-public buildings facing Seventeenth Street and framing the President's park, beginning with the satisfactory Corcoran Gallery and ending with the universally acclaimed Pan American Union—a group that Lord Lee of Fareham told me he considered the very finest group of its kind on earth.

The Commission of Fine Arts conceived the idea of turning the corner at Constitution Avenue and Seventeenth Street and making a frame for the Lincoln Memorial with a row of white marble buildings with ample gardens at the front. The continuous front line of green is the essential feature—extending sheer through to the Potomac.

The precedent was to be set by the National Academy of Sciences Building. The architect, Bertram G. Goodhue, helped to formulate the garden idea. Elihu Root and Secretary Charles D. Walcott saw to it that the money to carry out this ambitious project was forthcoming. The beauty of the achievement did the rest.

The Pan American Union Annex, and the administration building of the Public Health Service will occupy two more of the five possible spaces of the frame. The fourth space is unassigned. Perhaps it may go most fittingly to the Bureau of Education. There is apprehension lest it be used as a monumental approach to a group of modernistic buildings to the north. Heaven and good taste forbid such use!

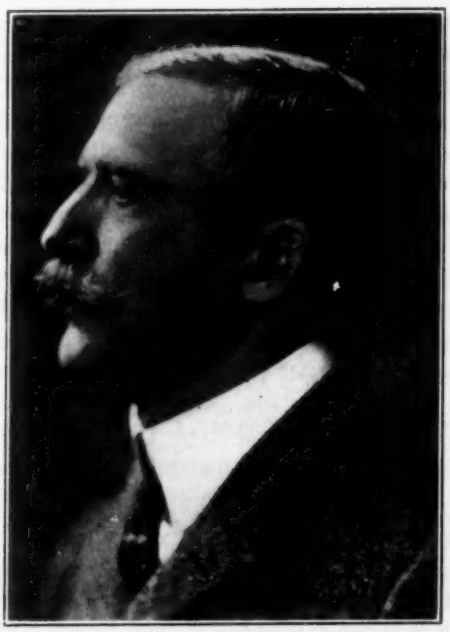
When the AMERICAL PHARMACEUTICAL ASSOCIATION came to the Commission of Fine Arts with their project for a building to occupy a portion of the frontage of the square between Twenty-Second and Twenty-Third Streets, the Commission joyfully embraced the opportunity to peg down the last of the five spaces with a building appropriate to its close proximity to the Lincoln Memorial and devoted to a purpose at once significant and important to human welfare. It has been difficult—at times it seemed impossible—for the American Pharmacists to meet the requirements of additional purchases of land, of costly materials and of gifts to the Government for widening Twenty-Third Street. Perhaps John Russell Pope's inspiring design for the AMERICAN PHARMACEUTICAL ASSOCIATION Building had much to do with the successful outcome of the tempestuous voyage through cross-seas stirred by conflicting winds, Congressional and otherwise. At any rate,

we are here to-day to break ground for a building which shall stand as a symbol of ethics in trade, honesty and fidelity in ministering to human needs, and constant advance in the science of good health."

President Harry A. Fowler, of the District of Columbia Medical Society, stressed the importance of the new institution as a closer tie between the interrelated professions of pharmacy and medicine.

President Walter D. Adams of the AMERICAN PHARMACEUTICAL ASSOCIATION said that the building would foster a closer relationship between members of the two professions.

Honorary President, Sir Henry S. Wellcome, of the AMERICAN PHARMACEUTICAL ASSOCIATION, was introduced as one of the foremost and leading pharmacists of the world and his activities in other fields of science and archæology are well known. He praised the efforts of the American Pharmacists and entertained no doubt that the project would develop into a great institution for the service of pharmacy and medicine and the public.



SIR HENRY S. WELLCOME.

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DR. CHARLES MOORE.

THE EIGHTIETH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The time is approaching for the opening of the Canadian-American Pharmaceutical Convention in Toronto—during the week of August 22nd. Exceptional railroad rates have been made—see your R. R. agent at once—you need not return by going route. Hotel rates for the convention are given on page 314 of the April number of the JOURNAL.

SCIENTIFIC SECTION

THE STRYCHNINE-BRUCINE RATIO OF NUX VOMICA AND THE RELATIVE POTENCY OF THESE ALKALOIDS.*

BY ROBERT W. MORRISON AND A. RICHARD BLISS, JR.**

In 1818 the discovery of Strychnine (35) and its isolation from St. Ignatius beans (*Strychnos Ignatii*) by Joseph Pelletier, a Parisian retail pharmacist, and Joseph Caventou, also a pharmacist of Paris, was announced. This was followed shortly after, in 1819, by the announcement of the isolation of Brucine from "*False Angustura Bark*" by the same investigators. The alkaloid Brucine was named for James Bruce, a Scottish traveler (44). The first definite clue concerning alkaloids came in 1842 when Gerhardt distilled Strychnine with potash and obtained an oily base, which was called "*Quinoleine,*" and later changed to "*Quinoline*" (13). Although at present the alkaloids Strychnine and Brucine are obtained almost exclusively from *Strychnos Nux Vomica,* in which they occur most abundantly in the seeds and in varying smaller quantities in the roots, fruit, pulp, wood, leaves and bark (8), they are found present together in some, as well as separately in other species of *Strychnos;* while in other species there is neither Strychnine nor Brucine, but another substance similar in action to these alkaloids.

Strychnos Ignatii contains on the average of 1.5 per cent of Strychnine and 0.5 per cent of Brucine (27); *Strychnos Tiute* (17) contains 1.4 per cent Strychnine and little or no Brucine; the wood of *Strychnos Ligustrina* contains Brucine only and to the extent of 2.2 per cent, while the bark contains 7.3 per cent of the same alkaloid. The seeds of *Strychnos Rhedii* contain Brucine only, and the same is true of *Strychnos Aculeata* of West Africa. *Strychnos Henningsii* contains neither Strychnine nor Brucine, but another alkaloid instead. *Strychnos Toxifera* and *Strychnos Castelnæi* contain the very toxic "*Curare*" or "*Woorari,*" used as arrow poison by South American Indians. *Strychnos Cinnamomifolia,* Thwaites, contains 2.57 per cent of total alkaloids, of which 2.231 per cent is Brucine, and 0.342 per cent Strychnine.

THE STRYCHNINE-BRUCINE CONTENT OF NUX VOMICA.

The Strychnine-Brucine content of Nux Vomica, as given in the literature, varies widely. Evers (9) states that the seeds contain from 2½ to 3 per cent of total alkaloids, and that the strychnine content is little less than half, the remainder being brucine. Newcomb and co-authors (30) give the total alkaloidal content as varying from 1.5 to 5 per cent. Hatcher and Wilbert (16) give the strychnine content as 1.25 per cent, but do not give the total alkaloidal, nor the brucine content. Henry (17) states that Nux Vomica contains two or three per cent of total alkaloids, and that the strychnine content is little less than half of the total alkaloidal content, the balance being brucine. Pictet and Biddle (35) say that Nux Vomica contains *about* 1½ per cent strychnine and *about* the same amount of brucine.

Billings (3) gives the proportion of strychnine in the seeds as 0.5 to 1.5 per cent, and states that the balance is mostly brucine. Rosenthaler (36) says that, according to origin, samples of Nux Vomica will show a variation of from 0.23 to 5.34 per cent of total alkaloids. He states further that the variety from Bombay shows a variation of from 3.3 to 4 per cent of total alkaloids, the Cochia variety from 3 to 3.5 per cent, and the Madras variety from 2.6 to 3.3 per cent. Hare, Caspari and Rusby (15) believe that both relatively and absolutely the

* Scientific Section, A. PH. A., Miami meeting, 1931.

** Laboratories of Pharmacology, University of Tennessee (Memphis).

alkaloids of Nux Vomica vary most widely. They say that in all probability the difficulty encountered in extraction methods causes analysts ordinarily to fail to obtain full results, that at least 3 to 4 per cent must be considered as existing in seeds of fair quality, and of this, strychnine is ordinarily present to the extent of one-third to one-half, the remainder being brucine. They say that the fixed oil is important from a pharmaceutical point of view, since it is troublesome.

Rusby, Bliss and Ballard (37) give the total alkaloidal percentage as varying from 1.5 to 3 per cent, rarely exceeding this amount. They claim that the relative amounts of the two alkaloids present vary greatly, and that strychnine is usually from one-third to one-half of the total. Scott (41) does not give the percentages of strychnine and brucine present, but states that brucine and strychnine are in combination with igasuric acid (strychnic). Youngken (46) gives the alkaloidal content of Nux Vomica as varying from 1.84 to 5.3 per cent.

Lancaster and Davidson (21) claim that the proportion of strychnine to brucine in the seeds varies as widely as 1.2 to 3.1 per cent. Munch (27) gives the average per cent of total alkaloids in *Strychnos Nux Vomica* as 2.5, consisting essentially of equal parts of strychnine and brucine. He asserts, however, that individual shipments often show a wide variation from this ratio.

From the foregoing references to the literature it appears that the total alkaloidal content of Nux Vomica varies most widely, from 2 per cent to as high as 5.3 per cent. In addition to the variability in total alkaloidal content, the strychnine-brucine ratio also varies widely, in some samples only 0.5 per cent strychnine to 2.5 per cent brucine, in others they are reported in about the same amount, and in some reports the strychnine predominates.

Rosenthaler (36) analyzed four hundred samples of Nux Vomica. The seeds were first pulverized and dried at 100° C. The methods used were those of the Swiss and the German Pharmacopœias, which are in accord with the United States Pharmacopœia so far as alkaloidal requirement is concerned, a total alkaloidal strength of 2.5 per cent being specified in each. The average of his first hundred samples was 2.802 per cent of total alkaloids; the second hundred 2.850 per cent; the third, 2.793 per cent; and the fourth, 2.898 per cent. The lowest yield in the first group of one hundred samples was 2.469 per cent; the second, 2.581 per cent; the third, 2.459 per cent; and the fourth, 1.169 per cent. The highest yield in the first group of one hundred samples was 3.119 per cent; the second, 3.281 per cent; the third, 2.991 per cent; and the fourth, 3.263 per cent. His results showed that of the first hundred samples investigated only one sample assayed below 2.5 per cent, thirty showed an average of from 2.5 to 2.75 per cent, fifty-nine from 2.75 to 3.0 per cent, and only three samples assayed above 3.0 per cent. In the second series none assayed below 2.5 per cent, twenty-five were from 2.5 to 2.75 per cent, sixty-two from 2.75 to 3.0 per cent, and only thirteen samples assayed above 3.0 per cent of total alkaloids. In the third series, again one sample assayed below 1.0 per cent, thirty-seven from 2.5 to 2.75 per cent, sixty-two from 2.75 to 3.0 per cent, and none assayed above 3.0 per cent of total alkaloids. The results of the fourth series show one sample below 2.5 per cent, eighteen between 2.5 and 2.75 per cent, sixty-six between 2.75 and 3.0 per cent, and fifteen samples above 3.0 per cent.

Ericson (10), using the process of analysis as described in the British Pharmacopœia (4), found a variation of 13.1 to 27.5 per cent of total alkaloids in twelve samples of Extract of Nux Vomica investigated. The strychnine content varied from 34 to 88.6 per cent, and the brucine content from 14 to 66 per cent. Extract of Nux Vomica is required to contain not less than 15.2 nor more than 16.8 per cent

of total alkaloids. He also reports that of six samples of tincture and the same number of samples of the powdered drug, the strychnine showed a variation of 45 to 56 per cent, and the total alkaloids present showed a much greater variation. Tincture of Nux Vomica should assay not less than 0.237 nor more than 0.263 per cent of total alkaloids.

In eleven samples of powdered Nux Vomica analyzed by Greenish and Bartlett (14) the total alkaloidal content varied from a low percentage of 2.26 to a high percentage of 2.8.

Lancaster and Davidson (21) report a detailed survey made in the Dominion of Canada on commercial pharmaceutical galenicals. They obtained samples of Fluidextract and Tincture of Nux Vomica from retail drug stores, manufacturers, physicians' supply houses and manufacturing agents. A total of one hundred and six preparations were collected and analyzed, consisting of forty-one fluidextracts and sixty-five tinctures. The methods used were those of the British Pharmacopœia, 1914. The alkaloids were determined gravimetrically. Their results show that twenty-nine (forty-five per cent) of the tinctures assayed within the limits of the British Pharmacopœia. Eight contained strychnine varying from 0.110 to 0.118 per cent, three were over strength, and the balance were decidedly weak. The results of the liquid extract analysis indicate that sixty-three per cent were much too low.

Dufilho (6) conducted a series of assays on samples of Tincture of Nux Vomica, and reports a higher content of brucine than strychnine, but he states that in powdered Nux Vomica there exists more strychnine than brucine. He reports fifty-five parts of strychnine to forty-five parts of brucine, and reached the conclusion that the alkaloidal contents of the commercial preparations, as determined by the methods of the French Codex, do not represent the actual contents of the drugs. He believes the official methods do not completely extract the alkaloids, and that months of time and tons of macerating liquid are required for a complete extraction by macer-percolation.

Schaeffer (39) carried out a series of experiments on powdered, Fluidextract, Extract and Tincture of Nux Vomica. Nine samples of the powdered drug collected at random were assayed first in accordance with the Ninth Revision of the United States Pharmacopœia for total alkaloidal content. The brucine present was then destroyed by treatment with nitric acid, and the assay completed in accordance with the Eighth Revision of the United States Pharmacopœia for strychnine content. It was taken for granted that the other alkaloids were present in such infinitesimal percentages that they did not justify consideration. The results show that all but two of the nine samples came up to the requirements of the U. S. P. IX for total alkaloids, three did not meet the specifications of the U. S. P. VIII for strychnine content, while two others met the U. S. P. IX requirements but not those of the VIII. Still another failed to pass either the old or the new requirements, while the last passed the U. S. P. VIII requirements but not the IX. In some cases his results on powdered Nux Vomica show the total alkaloids present as high as 3.53 per cent, and in others as low as 1.92 per cent. The strychnine content showed a variation of 0.73 per cent, the brucine content 1.12 per cent to 2.23 per cent. The assays of the Fluidextract, Extract and Tincture were carried out in the same manner. Results of the fluidextract analysis showed a variation in total

alkaloidal content of from 2.37 to 2.63 per cent. The strychnine content showed a variation of from 0.79 to 1.21 per cent, and the brucine, by difference, from 1.20 to 1.67 per cent. With six samples of the Extract, a variation in total alkaloidal content of from 14.89 to 17.1 per cent was found, and the strychnine varied from 8.89 to 10.48 per cent. Six samples of Tincture of Nux Vomica assayed from 0.237 to 0.263 per cent total alkaloids, the strychnine content from 0.080 to 0.114 per cent, and the brucine, by difference, from 0.110 to 0.171 per cent. In the series of analyses the percentage of strychnine and brucine varied from 33 to 53 per cent. Schaeffer, therefore, concluded that there is absolutely no relationship between the percentage of alkaloids (total) and that of strychnine.

The beginning of a new pharmacopœial decade, and the organization of the work involved in the revision of U. S. P. X has been attended by numerous proposals looking toward improvements in and modifications of present standards, the physical and chemical properties of galenical preparations, and the methods of standardization of pharmacopœial agents. Among the many suggestions which have been made, appears the proposal to return to the old method of standardizing Nux Vomica according to the strychnine-content only. The claim has been made that the present standards for the chemical assay of Nux Vomica are not full criterions of the pharmacodynamic activity of the crude drug and its preparations; neither do they represent their true physiological properties.

THE RELATIVE PHARMACOLOGIC ACTIVITY OF STRYCHNINE AND BRUCINE.

The general opinion concerning the relative pharmacologic action of strychnine and brucine is that the action of strychnine is many times greater than that of brucine. Billings (4) says that the action of brucine is many times more feeble than that of strychnine. Pictet and Biddle (35) state that the actions of strychnine and brucine are the same, but that brucine is many times less active than is strychnine. Hatcher and Wilbert (16) do not give a relative activity-ratio for strychnine and brucine, but state that brucine is of very minor importance since it contributes little to the action of the crude drug, and that strychnine is many times more active than brucine.

Lancaster and Davidson (21) state that strychnine is forty times more potent than brucine. According to Munch (27), brucine is much less potent than strychnine physiologically, and the determination of total alkaloids in Nux Vomica does not insure constancy of physiological action. Jenkins and DuMez (18) say that, from the standpoint of toxicity, brucine is eight times less active than strychnine. The official method of assay, according to them, is therefore not a correct measure of the therapeutic activity of Nux Vomica.

Washburn and Blome (44) give the relative activity of brucine to strychnine in a ratio of one to sixty. Wood and LaWall (45) claim that it is difficult for physiologists to determine the exact seat of action of pure brucine upon the human organism, since it is very difficult to separate it from strychnine, and that it was formerly thought that brucine was much less poisonous and acted as a depressant to the peripheral sensory nerves.

By using four specimens of brucine, the first three unwarranted and the last one warranted by Merck and Company, Mays (24), experimenting on frogs and using the nasal reflex method, showed that unwarranted specimens of brucine con-

tained strychnine as a contaminant as was evidenced by its typical action when larger amounts of the so-called pure brucine were used. He concluded that strychnine and brucine have a few points in common, but possess so many dissimilar ones that there is sufficient grounds for believing that their difference is not one of degree only. He states that the convulsions which appear early in strychnine poisoning, if at all, occur late in brucine poisoning; and that convulsions invariably develop before death in strychnine poisoning, while not infrequently in brucine poisoning death occurs without even a trace of spasm.

Zeiss (47), using a five per cent solution of pure brucine, found that on the unbroken skin it produced a local analgesic-anæsthetic effect, and in only two or three instances did the subjects with whom he worked complain of any degree of nervousness. He is of the opinion that such an effect in these cases was caused from the strychnine-like effect of the drug. He applied the solution to painful furuncles of the external auditory canal, with the result that in all cases the subject manifested almost immediate relief. In some fifty subjects to whom he applied the five per cent solution to painful surfaces, caused from the application of silver nitrate, copper sulphate and iodine, all were afforded relief. He believes that the analgesic effect produced by the five per cent solution of brucine is not equal to that produced by cocaine hydrochloride, that it is more lasting, but is much less reliable, and that the drug is not readily absorbed.

Lyons (22) states that the medical activity of Nux Vomica and the allied drug Ignatia is due chiefly to the strychnine which they contain; that brucine has a share in that activity but is comparatively unimportant, and that the relative proportion in which these alkaloids are present is so nearly uniform in the respective drugs that the percentage of strychnine furnishes a practically correct measure of the therapeutic value of a sample of either drug. He believes that, for comparison, the content of strychnine is a better criterion than that of total alkaloid.

From the data presented, it is obvious that there is much controversy regarding the total alkaloidal content, as well as the relative amounts of the two major alkaloids, strychnine and brucine, in samples of the powdered drug, the Fluidextract and Tincture of Nux Vomica. It seems, also, that the relative pharmacologic actions of these alkaloids, as described in the literature, vary most widely; some writers stating that brucine is eight times less toxic than strychnine, while others present the relative degrees of toxicity as one to sixty.

Fortunately or unfortunately the International Standards for Nux Vomica and its preparations are based on total alkaloids, and these have, therefore, become almost universally official. The British Pharmacopœia (4) adheres to a strychnine standard. In the current revision of the United States Pharmacopœia (10th) the standards of assay for Nux Vomica and its preparations are based upon the total alkaloidal content, the Pharmacopœia having abandoned the strychnine standard,[1] beginning with the Ninth Revision, in order that the standards of assay would conform with those of the International Standards. Nux Vomica and its galenicals are listed in the International Protocol (34), indicating that they are in agreement with the international requirements for alkaloidal strength.

The purposes of this investigation, therefore, were (A) to make a wide collec-

[1] The standard of assay in the Eighth Revision of the U. S. P. was based on Strychnine content alone, the requirement being not less than 1.25 per cent (33).

tion of samples of powdered Nux Vomica, manufacture the official preparations of the drug that are most frequently employed in therapeutics, and carry out proximate assays on the drug and preparations of the drug, first for total alkaloidal content, and then for the relative amounts of strychnine and brucine present, in order that some data might be derived to show the actual ratio existing between strychnine and brucine in Nux Vomica, and (B) to determine the relative pharmacologic activity of strychnine and brucine and their salts by means of various laboratory animals.

MATERIALS.

Samples of the crude powdered drug, Nux Vomica, were secured from eight different market sources. Microscopic examination[1] of each sample established its freedom from adulteration. A fluidextract and a tincture were made from each sample, using the United States Pharmacopœia X and National Formulary V methods (34, 28).

Samples of Strychnine, Brucine, Strychnine Sulphate, Strychnine Nitrate, Brucine Sulphate and Brucine Nitrate were purchased on the market, and their purity and strength established according to the pharmacopœial and National Formulary methods (34, 28). These alkaloidal agents were used for checking the methods of alkaloidal extraction employed in this investigation.

CHEMICAL METHODS (PROXIMATE ASSAYS).

The United States Pharmacopœia first introduced drug assays about fifty years ago, but studies of the methods of extraction of alkaloidal-bearing drugs have been undertaken for more than 125 years (43).

Among the various methods for the extraction of the alkaloids of Nux Vomica which have been proposed from time to time, is the automatic extraction method of Palkin, Murray, etc. (31, 32), devised to replace the tedious hand operations. Complicated construction, lack of effectiveness and limitation of automatic features are the major criticisms of this method. The short period of extraction, one to two hours, is its chief advantage.

McGill and Wagener (26) and McGill and Faulkner (25) applied electrometric titration methods to Nux Vomica and its preparations. McGill and Wagener's method yields values that are higher than those obtained by the official methods, while the method of McGill and Faulkner gives values which compare favorably with those obtained by the official methods. The period of time required for the purification of the alkaloids is shortened by these methods.

Beal and Lewis (2) are of the opinion that the more practical and more accurate methods of assay are those based upon the facts that most alkaloids are insoluble in water but soluble in organic solvents, while most of their salts are soluble in water but insoluble in organic solvents. The official methods are based upon these general principles, and these methods are known as the "shaking-out methods." Such methods assume that the alkaloid is insoluble in neutral aqueous solutions, and that the alkaloidal salt is almost insoluble in the immiscible solvents used. The official methods assume also that the salt is neither hydrolyzed by the aqueous solvent nor decomposed by the organic solvent.

[1] By A. John Schwarz.

The rate of extraction of the alkaloids by means of the immiscible solvents depends upon the coefficient of distribution for alkaloid between the two immiscible liquids, a constant which has been given the name "extraction factor," meaning the ratio of the amount of alkaloid in the layer of added solvent to the amount that was originally present in the first solution. Beal and Hamilton (1) claim that this term is more expressive than "partition ratio," since the latter tells only the partition for one molecular species between two layers of equal volume, while "extraction factor" tells at a glance the completeness of the extraction.

In the extraction of alkaloids from Nux Vomica, advantage is taken of the fact that they occur in the form of salts which are soluble in water or alcohol, or a mixture thereof, and may be removed by a mixture of these two solvents. This is done in the official methods for the preparation of tinctures and fluidextracts.

When the alkaloids, strychnine and brucine, are extracted from the crude drug or their preparations, they are accompanied by many other forms of extractive matter (1), which consist essentially of albumin, proteins, fats, resins, gums, organic acids, coloring matter and carbohydrates. The carbohydrates do not interfere with extractions, but the other elements must be removed or the final estimation, whether determined by gravimetric or volumetric methods, will not be accurate.

Sabalitschka and Jungermann (38) recommend a method of extraction which first removes the fixed oil with petroleum ether, the alkaloids present being determined by volumetric methods. The removal of the fixed oil greatly facilitates the assay process and gives more accurate results, since the presence of a fixed oil causes the results to run high.

Beal and Hamilton (1) found that lead acetate, when used as a clarifying agent for alkaloids, causes a removal of the coloring matter and organic acids, but has no harmful effect on the alkaloids. They report also that the addition of an aqueous solution of sodium chloride, half saturated, causes the removal of a greater amount of alkaloids at a single extraction.

The use of very strong or very weak solutions of ammonia has been suggested as a great source of error in alkaloidal assays because of the formation of tedious emulsions which do not readily separate. Goldberg (12) found that very troublesome emulsions were formed when ammonia water between 6.2 and 8.3 per cent in strength was used. Ammonia waters of 9 per cent and 9.96 per cent strength gave the most satisfactory results. With these two strengths any slight emulsions formed were easily broken up with but little deposition of extractive matter. Ammonia water stronger than 10.5 per cent precipitated a considerable amount of extractive matter and caused very troublesome emulsions. It is his opinion that the official ammonia water, containing between 9.5 and 10.5 per cent of ammonia, gives best results with the least amount of inconvenience.

In the determinations of the alkaloids of powdered Nux Vomica and its preparations, there seems to be a great divergence in opinion regarding the estimation of the alkaloids by volumetric and by gravimetric means. There is likewise a difference in opinion regarding the method that should be employed for the destruction of brucine in a common strychnine-brucine residue. Dufilho (7) favors the volumetric method as the more satisfactory, and recommends that the brucine be destroyed with as many times 15 cc. of a mixture of equal parts of nitric acid and

water as there are grams of alkaloid. The red liquid then is to be rendered alkaline with sodium hydroxide after a period of one hour, and the strychnine determination made by the titration method.

Schimpf (40) claims that, because of the fact that the alkaloidal residue is rarely, if ever, in an absolutely pure condition, gravimetric results are by no means correct and may vary widely. He believes that the volumetric method is more satisfactory.

Fuller's (11) opinion, based on the results of collaborative work, is that greater reliance can be placed in a gravimetric method.

Lachaise (20) criticizes the standardization of the strychnos drugs based on the volumetric determination of total alkaloids on the grounds that the accepted equivalent, 364 (the arithmetical means of 395 and 334, the respective molecular weights), is necessarily inaccurate, since the two alkaloids are rarely, if ever, present in equal proportions. He states further that the chemical standard, based on strychnine content, accords better with the physiological standard, since the physiological action of strychnine is not greatly affected by brucine.

The British Pharmacopœia (4) directs that brucine be destroyed in the strychnine-brucine residue by adding three cc. of a mixture of equal volumes of distilled water and nitric acid at a temperature of 40° C. for a period of ten minutes, the solution then transferred to a separatory funnel and rendered alkaline with sodium hydroxide, and shaken out with 10-, 10- and 5-cc. portions of chloroform, and the strychnine determined by weight after drying to constant weight at 100° C.

There are numerous criticisms throughout the literature of the British Pharmacopœia method for the destruction of brucine in a common strychnine-brucine residue. Dott (5) recommends that brucine be destroyed at ordinary rather than at an elevated temperature, and that twenty minutes is a sufficient length of time to cause the reaction to be complete when 1 cc. of concentrated nitric acid is used for each 0.25 Gm. of brucine.

Short (42) found, in running parallel assays on the destruction of brucine by the B. P. Method, that the lower temperature in nitration gave better results in estimation by weight than by the volumetric method. Jenson (19) also criticizes the method of the B. P., claiming that with known amounts of strychnine and brucine he showed a loss of 9.9 per cent strychnine, mainly caused by nitrations carried out at 50° rather than at 20°. By improving the methods of oxidation (lowering temperature) results were correct to within 1.75 per cent, while in the parallel 50° nitration, the loss in the recovery of strychnine was 11 per cent. He favors the volumetric method for the estimation of strychnine, claiming that gravimetric results are 8.8 per cent too high with known amounts of the alkaloids employed.

Lyons (23) reports that in the assay of Nux Vomica and its preparations the brucine is destroyed by oxidation with nitric acid having a specific gravity of 1.42, and that the reason for non-destruction of all the brucine is due to a lack of nitrous acid in the nitric acid. Some investigators have added a trace of sodium nitrite to start the reaction, but he employed powdered sugar, 10–20 milligrams, and obtained good results.

Nelson (29) gives a method for the destruction of brucine in the combined alkaloidal residue with 18 cc. of a mixture of equal parts of 2.5 per cent sulphuric and 2.5 per cent nitric acids, the acids to stand in contact with the alkaloids for a

period of ten minutes, and the strychnine solution then transferred to a separatory funnel, rendered alkaline, and re-extracted and determined.

Lyons (22) also gives a method for the destruction of brucine by using 1.5 cc. of strong nitric acid and 1 cc. of a 5 per cent solution of sodium nitrite in water, the mixture to be stirred well and allowed to stand for exactly ten minutes to cause a complete destruction of the brucine.

In this investigation, a preliminary study of the methods of Nelson, Lyons, the British Pharmacopœia and the U. S. P. VIII for the destruction of brucine on known amounts of strychnine and brucine was carried out. By Nelson's method only 2 per cent of known amounts of brucine was destroyed. This method apparently does not have sufficient nitrous acid in the nitric acid to cause the reaction to start. The U. S. P. VIII method showed a destruction of only 93 per cent brucine. The British Pharmacopœia method showed a complete destruction of brucine, but also a destruction of five per cent of the strychnine present. Lyons' method, a modification of the British Pharmacopœia method, showed a complete destruction of brucine and a complete recovery of the strychnine present in known samples of the combined alkaloids. Lyons' method, therefore, was the one employed in this investigation for the destruction of brucine in the combined strychnine-brucine residue.

Samples of powdered Nux Vomica, Fluidextract and Tincture of Nux Vomica were assayed first for total alkaloids by the U. S. P. X methods with one modification, *viz.*, the omission of the final volumetric step. The combined alkaloidal residue was treated with one and one-half cc. each of strong nitric acid and five per cent solution of sodium nitrite in water, the mixture stirred well and allowed to stand for exactly ten minutes at room temperature to cause the destruction of the brucine. The strychnine solution was then rendered alkaline with 10 per cent Ammonia Water, and the strychnine re-extracted and weighed, after drying to constant weight at 100° C., and estimated as the free alkaloid.

The methods employed in the assay of the powdered Nux Vomica, Fluidextract, and Tincture of Nux Vomica follow:

A.—POWDERED NUX VOMICA.

The U. S. P. X method (34) for total alkaloids was followed, the only modification being the determination of the alkaloids by gravimetric means only. The chloroformic solutions were filtered into a tared beaker, evaporated to dryness on a water-bath at a temperature not exceeding 60° C., then dried in an oven to constant weight at 100° C., and weighed.

In the extraction of the alkaloids with sulphuric acid, seven portions of the solvent were used, this amount, being necessary to cause complete extraction of the alkaloids. 20-, 20-, 15-, 15-, 10-, 10- and 5-cc. portions of the acid were used.

During the chloroformic extraction of the free alkaloid from the alkaline liquid, usually seven portions were necessary to cause a complete extraction of the alkaloidal bases, and 25-, 20-, 15-, 15-, 10-, 10- and 5-cc. portions were employed.

DETERMINATION OF STRYCHNINE AND BRUCINE IN THE COMBINED RESIDUE.

The combined residue was treated with 3 cc. of a mixture of equal parts of nitric acid, having a specific gravity of 1.42, and a five per cent solution of sodium

nitrite in water. The mixture was kept at room temperature, and the combined solutions allowed to stand in contact with the residue for a period of exactly ten minutes. The red solution of strychnine was then transferred to a separatory funnel, washing all traces of the alkaloid from the vessel, rendered alkaline with Ammonia Water, and completely extracted with chloroform (20, 15, 10 and 5 cc. usually being a sufficient amount to cause complete extraction), filtering each portion as drawn off into a tared beaker. Extraction was carried out until Mayer's Reagent showed that extraction was complete. The chloroform was then evaporated off, and the residue weighed. The brucine was determined by difference.

B.—FLUIDEXTRACT OF NUX VOMICA.

The National Formulary method (28) was employed in the assay of Fluidextract of Nux Vomica, the only modification being the determination of the alkaloids by weight rather than by the volumetric method given.

DETERMINATION OF STRYCHNINE AND BRUCINE IN THE COMBINED RESIDUE.

The method described under powdered Nux Vomica was employed, the only difference being that more chloroform was used to completely shake out the strychnine, 20-, 20-, 15-, 15- and 10-cc. portions having been used. The strychnine was determined again by weight, and the brucine by difference.

C.—TINCTURE OF NUX VOMICA.

The method employed in the assay of Tincture of Nux Vomica was that of the U. S. P. X (34) for total alkaloids, the brucine then destroyed by oxidation with nitric acid and sodium nitrite, and the strychnine shaken out and determined by weight. The only modification of the official method was the final determination of the alkaloidal residue by weight rather than by volume, as the Pharmacopœia specifies.

DETERMINATION OF STRYCHNINE AND BRUCINE IN THE COMBINED RESIDUE.

The method which has been described under powdered Nux Vomica and Fluidextract of Nux Vomica was used also in assaying the Tincture.

PHARMACOLOGIC METHODS—A. FROGS.

The idea presented itself that the possible reason for such a wide difference in opinion regarding the relative toxicity of Strychnine and Brucine and their respective salts was due to the particular specie of laboratory animal with which various investigators have worked, and the specie susceptibility of the particular type of animal employed. Most of the authors consulted do not state the type of animal used in any comparative work. In this investigation the pharmacological studies were carried out on four different species of common laboratory animals, *viz.*, the frog, the rabbit, the dog and the cat.

TECHNIQUE OF THE FROG METHOD.

The common grass frog, *Rana Pipiens*, was employed in these observations. They were obtained from Wisconsin, and stored in the frog ponds until ready for use.

The animals were then removed, the excess water wiped off, and the animals accurately weighed in a tared beaker to the first decimal place.

The solutions of strychnine sulphate and brucine sulphate for hypodermic injection were made up in sterile physiological saline solution, and the concentration so adjusted that each animal would receive approximately the same amount of fluid (about 0.5 cc.).

The fluid containing the alkaloidal salt was injected into the ventral lymph sac by means of a Luer type hypodermic syringe. A preliminary series of observations was conducted in order to arrive at the comparative convulsive dose of the drug. Observations were made continuously after the injection of the dose, and the time was noted when the animal became hypersensitive, and when the first convulsion occurred.

B.—RABBITS.

Rabbits used in the observations were obtained from local sources. The weight of each animal was ascertained in kilograms. The solutions of strychnine and brucine sulphates were made up in sterile, physiological saline solution, as described in the technique of the frog method. The dose was administered by subcutaneous injection in the abdominal region with a sterile hypodermic syringe, the concentration being adjusted so that each animal received approximately the same volume of fluid.

Observations were made constantly, and the time to hypersensitivity, and to the first convulsion were recorded.

C.—DOGS.

The weight of each dog was determined in kilograms, and the solutions of strychnine and brucine sulphate prepared in sterile, physiological saline solution, and injected by means of a sterile syringe subcutaneously in the abdominal region. .

Observations were made constantly, and the time recorded when the animal appeared hypersensitive, and when the first convulsion occurred.

D.—CATS.

The same technique was employed with cats as has been described under "rabbits" and "dogs." Observations again were made constantly, and the length of time to hypersensitivity, and the time to the first convulsion were noted.

(To be continued)

A STUDY OF THE PREPARATION, QUALITATIVE DIFFERENTIATION TESTS, AND METHODS OF EVALUATION OF THE VARIETIES OF ALOE.*

A THESIS SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF THE UNIVERSITY OF MINNESOTA.[1]

BY KARL GOLDNER.

Aloe, U. S. P. X (1), is the inspissated juice of the leaves of *Aloe Perryi* Baker, known in commerce as Socotrine Aloe; of *Aloe vera* Linné, known in commerce as

* Read before the Northwestern Branch, A. PH. A., May 24, 1932.

[1] In partial fulfilment of the requirements for the degree of Master of Science.

Curacao Aloe; or of *Aloe ferox* Miller, known in commerce as Cape Aloe (*Fam. Liliaceæ*).

Aloe yields not more than 4 per cent of ash, not more than 10 per cent of moisture and not less than 50 per cent of water-soluble extractive.

Unground Socotrine Aloe occurs in yellowish brown to blackish brown, opaque, smooth and glistening masses; fractured surface somewhat conchoidal; odor characteristic.

Unground Curacao Aloe occurs in orange to blackish brown, opaque masses; fractured surface uneven, waxy, somewhat resinous; odor characteristic, disagreeable.

Unground Cape Aloe occurs in reddish brown masses, usually covered with a yellowish powder, or in thin, transparent fragments, of a reddish brown color; fracture smooth and glassy; odor characteristic, sour and disagreeable.

The taste of each variety of Aloe is nauseous and very bitter.

Powdered Aloe is yellowish brown to dark reddish brown; mounted in a bland, expressed oil, it appears as yellowish to reddish brown angular or irregular fragments, the depth of color depending to some extent on the thickness of the fragments.

TESTS FOR IDENTIFICATION AND DIFFERENTIATION.

Aloe is tested according to Bainbridge and Morrow (2), who observed that, upon addition of nitric acid, Socotrine Aloe gives a yellowish to reddish brown solution; Curacao Aloe a deep red solution; Cape Aloe a reddish brown solution, changing to purplish brown and finally to greenish.

About 1 Gm. of powdered aloe, accurately weighed, is mixed in a flask or bottle with 25 cc. of cold water, shaken occasionally during two hours, transferred to a filter, tared after having been dried over sulphuric acid, and washed with sufficient water to make the filtrate measure 100 cc. The residue on the filter, dried over sulphuric acid, should not exceed 50 per cent of the weight of powdered aloe taken. The color of the filtrate, viewed in the bulb of a 100-cc. volumetric flask, is light yellowish brown with Socotrine Aloe, reddish brown with Curacao Aloe, and yellowish with Cape Aloe. The filtrate darkens upon standing.

To 5 cc. of the filtrate mentioned above are added 2 cc. of nitric acid: the mixture is of a yellowish to yellowish brown color with Socotrine Aloe; a deep red color with Curacao Aloe; a reddish brown color, changing to vivid green, with Cape Aloe.

The filtrate mentioned above responds to Schonteten's test for the presence of aloin. To 5 cc. of the filtrate are added 45 cc. of water and 20 cc. of sodium borate solution (1 in 20): a greenish fluorescence results and, upon standing, the liquid acquires a brownish color.

The filtrate mentioned above responds to Bornträger's test. To 10 cc. of the filtrate are added 90 cc. of water and the solution shaken with 10 cc. of benzene: upon separating the benzene layer and adding to it 5 cc. of ammonia T. S., a permanent, deep rose color is produced in the lower layer. The color is dependent upon the presence of emodin.

Aloe should be free from gum or inorganic impurities. A mixture of 1 Gm. of Aloe and 50 cc. of alcohol are heated gently and then cooled: a nearly clear solution should be obtained.

Cripps and Dymond's tests (3) for the detection of aloe is made as follows:

One grain of the solid substance to be tested is treated in a porcelain dish, or in a glass mortar standing on white paper, with 16 drops strong sulphuric acid and triturated until the whole is dissolved. Four drops of nitric acid of 1.42 sp. gr. are then added, and this is followed by 1 oz. of distilled water, when, in the presence of aloe, a color will be produced varying from deep orange to crimson, according to the kind of aloe employed. The result is confirmed by adding ammonia, when the color is intensified, usually to a deep claret red. The test not only allows of the detection of aloe, but also gives a fair indication of the kind of aloe under examination.

Stacy (4) recommends the addition of a fresh solution of potassium ferrocyanide to a cold aqueous solution of aloe, when a pink color, which appears quickest in the boiling solution, is produced by 1 part in 10,000 of Barbadoes aloe. Socotrine or Cape aloe (1 part in 250) or commercial aloin, give green colors. No reaction is obtained in the presence of cascara sagrada or rhubarb. Previous extraction with petroleum spirit, benzene or chloroform, though not with ether or ethyl acetate, produces a negative reaction.

Klunge's test (5) consists in the addition, to a highly dilute and therefore nearly colorless solution of aloe, of 1 drop of copper sulphate solution, followed by the addition of sodium chloride and alcohol. On the addition of the copper sulphate, the original yellow color of the solution is intensified. The addition of the salt, however, followed by a little alcohol or warming, changes this to a red color, the intensity and permanence of which differs with the different varieties of aloe. The use of alcohol may be avoided if the solution is warmed, but the addition of a considerable amount, as recommended by Leger, has the advantage that it dissolves the flocculent precipitate caused by the salt.

The plant from which the drug aloe is obtained has stems about a meter high, which bear at the summit a cluster of thick, succulent leaves, lanceolate and spinous-toothed.

The methods of obtaining aloe commercially vary somewhat with the locality. The usual method (6) is to dig a hole in the ground and cover the bottom of it with a goat or horse hide. The leaves are cut with a curved knife and placed in a circle, the cut surfaces under and to the inside, to a height of one meter. By this method of packing, the cut surfaces of all layers can drain directly into the hole After several hours the leaves are removed and the sap poured into a container, often an empty petrol can. The juice is then thickened by boiling in iron tubs over a free fire by a rather carelessly conducted process. During the inspissation, the juice is stirred vigorously with a wide wooden spatula. The soft, warm mass is then poured into boxes, gourds (Barbadoes aloe), or sometimes monkey skins (Socotrine aloe.)

On the Island of Barbadoes the leaves are cut off at the flowering time and placed in "V" shaped troughs of which several empty into a container. The sap is allowed to flow for 1 to 2 hours, is collected in large reservoirs, and then evaporated in copper vessels. The foam is skimmed off as it forms.

CONSTITUENTS OF ALOE.

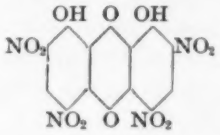
The most important constituent of aloe is aloin, which was first crystallized and named by the Edinburgh apothecaries Th. and H. Smith in 1851. Aloins from Barbadoes, Cape (7), Uganda (8), Zanzibar (9), Socotrine (9), Curacao (10), and Jafferabad (11) aloes are said to be identical. Aloin from Sicilian aloe and aloin from Natal aloe are said to be of different constitutions.

Barbaloin crystallizes with three molecules of water, which may be removed by drying at 110° in a current of hydrogen. When dry, it is very hygroscopic. It forms pale yellow needles, whose melting point varies according to the source of the aloin. The melting points of water-free aloins are given by Tschirch (12) as: Barb-, Cur-, Cape and Uganda aloin: 147°; Jafferabad: 152°; Socotrine: 157°; Zanzibar: 212°. α_D in aqueous solution: + 21.4°.

If barbaloin is heated with concentrated sulphuric acid and to an alcoholic solution of the residue is added an alcoholic solution of potassium cyanide, a violet color is formed which changes to a rose color (Formanek (13)). A drop of a solution of barbaloin in concentrated sulphuric acid, over which vapors of fuming nitric acid are blown, becomes blue in the center, violet on the edges. If the solution is

diluted with water, it becomes cherry-red; by the addition of sodium hydroxide solution, deep carmine red (Leger (14)). It is scarcely precipitated by lead acetate in excess, differentiating aloin from the oxymethyl-anthraquinones of rhubarb, frangula, etc. (Kremel (15)).

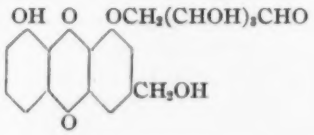
The anthraquinone-glucosidal nature of aloin is shown by the splitting off of aloe-emodin (Tschirch (16), Oesterle (17)) and by its reaction with nitric acid. Aloe upon treatment with nitric acid gives chrysamic acid (Schunck (18)); aloin was shown to be the reacting substance (Stenhouse (19)). Chrysamic acid is to be thought of as a tetranitrochrysazin (Liebermann and Giesel (20)).



By the oxidation of aloin is formed alochrysin ($C_{15}H_8O_5$ Oesterle (17)). The oxidation with Caro's acid liberates tri- and tetraoxymethylanthraquinone (Seel (21) & Scharf (22)). The chromic acid oxidation liberates rhein (Oesterle (17)).

By long standing of an alcoholic solution (Leger), or by the action of alcoholic hydrochloric acid (Oesterle (17)), or by the passage of air through an alkaline solution of aloin (Tschirch and Pedersen (23)), or by the action of sodium peroxide (Seel (21)), aloe-emodin is split off. Barbaloin treated with sodium peroxide liberates a pentose. By treatment of aloin with hydrogen chloride in alcoholic solution, a crystalline decomposition product and a sugar are formed (Rochleder and Czumpelik (24)).

Aloin is a pentoside which upon hydrolysis yields aloe-emodin and *d*-arabinose.



This formula, $C_{20}H_{18}O_9$, was promulgated by Leger and is the one now generally accepted.

In aloe, aloin is associated with other related substances. An isomer, isobarbaloin, $C_{14}H_6O_2$ (CH_2OH). OH-O(8)-$CH_2(CHOH)_3$ CHO, is found in Barbadoes and Curacao aloes; in large amounts in Jafferabad aloe; in very small amounts in Socotrine aloe; and not at all in Cape and Uganda aloes.

Another companion compound of Barbaloin is the non-crystallizable *B*-barbaloin, an optical isomer of barbaloin, from which Leger made a crystalline tetrachloride, $C_{21}H_{16}Cl_4O_9$-5 H_2O. A third, aloesol, was recognized by Leger as a new phenol, and forms another crystalline tetrachloride, $C_{11}H_4Cl_4O_3$. It occurs in Cape and Uganda aloes, in traces in Jafferabad aloe, and not in Barbadoes and Curacao aloe. Aweng (25) obtained a "soluble oxyanthraquinone glucoside" from Barbadoes aloe and Hoffbauer from Curacao aloe. Tschirch and Hoffbauer (26) state that other substances are present which yield chrysamic acid.

Aloe-emodin occurs as a decomposition product of aloin.

The resinous material consists chiefly of a resinotannol ester of cinnamic acid

(Curacao and Barbadoes aloes) or of a resinotannol ester of paracumaric acid (Cape aloe).

A pale yellow volatile oil may be obtained by distillation with 1% potassium hydroxide solution. The oil imparts the characteristic odors to the different varieties and its composition varies.

QUANTITATIVE METHODS FOR THE EVALUATION OF ALOE.

For many years investigators have worked upon methods for the evaluation of aloe. The methods which they recommend give widely divergent results when applied to any one variety of aloe; therefore, they appear not to be accurate quantitative chemical determinations of the aloin present. For these reasons a study was made of these analytical methods with the hope that such a study might contribute to the formulation of a chemical process for the determination of aloin in aloe.

The amounts of moisture and ash present indicate the age of the drug and also the care with which it has been prepared. The U. S. P. X requires that aloe should yield not more than 4 per cent of ash nor more than 10 per cent of moisture. These tests were made in the prescribed manner and the following results were obtained:

	Moisture.		Ash.	
Barbadoes	5.09	5.28%	1.63	1.55%
Cape	5.31	5.31%	0.817	0.724%
Socotrine	3.70	3.89%	2.46	2.47%

The following method described by Tilden (27) is regarded by H. C. Plenge (28) as the best practicable plan of preparing aloin on the small scale from most varieties of aloes:

> Twenty-five grams of the sample should be dissolved in boiling water, the liquid acidified with hydrochloric acid, and allowed to cool. It is then decanted from the precipitated resinous matter, evaporated to about 50 cc., and set aside for two weeks for crystals to form. The liquid portion is then poured off, and the crystals pressed between folds of filter paper. The crude aloin thus obtained is contaminated with a considerable quantity of resin, from which it is best purified by treatment with ethyl acetate, with occasional agitation, till the liquid acquires a brown color, and the yellowish color of the crystals can be distinguished. The liquid is then quickly and carefully poured off, and the crystals dried. Treated in this manner, Barbadoes aloes, for which the method is specially adapted, gave an average of 9% of aloin; whereas Curacao averaged 7.5% and Bonare 7%. Socotrine aloes yielded 3%, but on repeating the process on the same sample, no aloin could be obtained. However, it was isolated to the amount of 10% by digesting 2 parts of the aloes in 3 parts of alcohol for 24 hours, and then heating the liquid over a water-bath for 2 hours. After cooling, the liquid was poured off from the resin, filtered, and set aside in a loosely covered dish to crystallize. The crystals of aloin were washed with a little alcohol and dried.

Tilden's method was applied to three varieties of aloe and these results were noted:

Barbadoes	17.24–16.88%
Cape	4.04– 5.32%
Socotrine	9.04–11.72%

The method may well be used for the laboratory preparation of aloin, but as a quantitative determination it does not appear to be accurate because all of the aloin present probably does not precipitate, and the contaminating resin is not easily completely removed.

For the estimation of aloin in aloes, Schäfer (29) has proposed the following method, based on the fact that aloin, in ammoniacal solution, forms compounds with the alkaline earths, which are but slightly soluble, and from which the aloin can be recovered on treatment with an acid:

Fifty grams of aloes are treated with 300 cc. of boiling water containing a few drops of hydrochloric acid, and when cold the solution is separated from the resin. Fifty cc. of 20% ammonia and 30 cc. of 50% calcium chloride are then added, and the whole well shaken. After 15 minutes, the precipitate is separated, and after being pressed is triturated in a mortar with a slight excess of hydrochloric acid. The aloin and calcium chloride are dissolved in as little boiling water as possible and filtered. On cooling, the aloin separates in crystals. By this method, Schäfer found from 15 to 30% of aloin in aloes of different origin.

This method yielded:

Barbadoes	25.48–29.34%
Cape	15.30–17.00%
Socotrine	12.74–13.02%

The precipitate appeared to include an appreciable amount of resin which would tend to make the results high.

Leger's (30) method is as follows:

Five hundred grams of the sample are boiled with a mixture of 1800 cc. of chloroform and 600 cc. of methanol for four hours under a reflux condenser. After settling, the supernatant liquid is decanted and distilled, and the residue taken up in absolute alcohol, from which crystals of aloin separate in 3 or 4 days. By this means, 5 to 6% of aloin was obtained from Cape aloes and from Barbadoes aloes, 10% from Curacao aloes and as much as 20% from Jafferabad aloes. Socotrine aloes gave only 4%. The method as described above cannot be considered as possessing the attributes of a quantitative method, but Leger's object was mainly to get large quantities of the aloins to serve for their separate detection and approximate estimation.

Tschirch and Hoffbauer (26) propose the determination of the active ingredients as the part soluble in a methanol chloroform mixture. The active ingredients include, not only aloin, but aloe-emodin and also other materials which have purgative properties. The residue is regarded as worthless resin.

Five grams of aloe are macerated for 2 hours in a 50-cc. flask with 5 cc. of methanol. The liquid is then heated to 50–60°, 30 cc. of chloroform added gradually with agitation, and the whole allowed to stand for half an hour. The yellow-colored liquid is filtered from the separated resin through a small fluted filter into a weighed Erlenmeyer flask and the methanol-chloroform mixture distilled off and used again to extract the material in the first flask. The second methanol-chloroform extract is filtered into the tared flask, and the solvent again distilled off and used to extract the residue in the first flask. This procedure is repeated four times. According to Tschirch and Hoffbauer, the extracted material, when dried at 100°, should weigh not less than 4 Gm. 81 to 87% active material was obtained from Cape aloe, 67% from Curacao, and 37% from Socotrine aloe.

The procedure was applied to the same three varieties with the following results:

Barbadoes	56.34–57.42%
Cape	75.28–77.73%
Socotrine	49.26–49.35%

These results were lower in the case of Barbadoes and Cape aloes and higher in the case of Socotrine aloe. Some difficulty was encountered in obtaining concordant results.

L. v. Itallie (31) considers the above method open to objection on the ground that much material remains in the original flask and is included as resin which is not resin at all, but other substances protected from the solvent action of the chloroform by a coating of resin. He recommends the following modification:

Five grams of the powdered sample are warmed with 5 cc. of methyl alcohol in a 50-cc. flask until a homogeneous liquid is obtained. Thirty cc. of chloroform are then added, and the mixture violently and continuously shaken for 5 minutes. By this time most of the separated resin will have adhered to the flask. After standing till clear, the liquid is decanted. The residue is again dissolved in methyl alcohol, and the resin again precipitated by means of chloroform, and this treatment is repeated once more.

In this way L. v. Itallie found 57 to 82% active material in Cape aloe and 79 to 89% in Curacao aloe. This method yielded:

Barbadoes	76.48–76.92%
Cape	82.47–82.84%
Socotrine	70.31–70.39%

Although L. v. Itallie objects to the method of Tschirch and Hoffbauer, it might be said with equal weight that the use of three separate portions of methanol extracts considerable resin and the result is higher than it should be.

The same author attempts the determination of aloin as tribromaloin. With pure aloin the method was successful but, applied to aloes from the Cape and Curacao, it indicated over 70% of aloin, which L. v. Itallie considers to be much too high.

Tschirch & Hoffbauer (26) have estimated aloin on the basis of the green fluorescence produced when borax is added to a solution of aloe.

The material extracted by the methanol-chloroform mixture is dissolved in hot water without filtering. Four hundred cc. of a saturated borax solution is added to make about one liter. The solution is then diluted until the fluorescence is barely perceptible. This fluorescence is shown by barbaloin diluted 1 to 250,000. Their results indicated the presence of 16–20% of aloin in Cape aloe, 16–18% in Barbadoes, 18% in Curacao, and 8% in Socotrine aloe. Applied to 3 varieties of aloe, this method showed:

Barbadoes	12.96–12.99%
Cape	16.23–17.15%
Socotrine	11.14–12.67%

Little difference is shown in the strength of the different varieties. The end-point is not distinct, and the fluorescence fades in a short time. The test must be completed in as little time as possible.

A consideration of the constitution and configuration of aloin suggested a possible method for its quantitative analysis, namely, the hydrolysis of the aloin with the splitting off of a pentose (arabinose), the conversion of the pentose to furfural and the precipitation of the furfural by means of phloroglucinol.

METHOD OF PROCEDURE.

The phloroglucinol (symmetrical trihydroxybenzene) solution is prepared by dissolving 11 Gm. of phloroglucinol in 300 cc. of warm 12% hydrochloric acid. This solution is poured into enough cold 12% hydrochloric acid to make 1500 cc., and the liquid allowed to stand several days for crystallization of diresorcinol and filtered immediately before using.

Kröber (32) proposed the following method for pentoses.

A quantity of the material, chosen so that the weight of the phloroglucide obtained shall not exceed 0.300 Gm., is placed in a flask with 100 cc. of 12% hydrochloric acid and several pieces of recently heated pumice stone. The flask is placed on a wire gauze, connected with a condenser and heated, rather gently at first, so that 30 cc. are distilled over in about ten minutes, the distillate passing through a small filter paper. The 30 cc. distilled are replaced by a like quantity of 12% hydrochloric acid which is added by means of a separatory funnel in such a manner as to wash down the particles adhering to the sides of the flask, and the process continued until the distillate amounts to 360 cc. To the completed distillate is added gradually a quantity of the phloroglucinol solution and the mixture stirred thoroughly. The amount of phloroglucinol used should be about double that of the furfural expected. After the addition of the phloroglucinol, the solution first turns yellow, then green and very soon an amorphous greenish precipitate appears, which grows rapidly darker until it finally becomes almost black. The solution is made up to 400 cc. with 12% hydrochloric acid and allowed to stand over night.

The amorphous black precipitate is filtered through a tared Gooch crucible and washed carefully with 150 cc. of water in such a way that the water is not entirely removed from the crucible until the very last. The crucible is then dried for four hours at 100° and weighed. The increase in weight is calculated as phloroglucide.

a For weight of phloroglucide "a" under 0.03 Gm.: pentoses = $(a + 0.0052) - 1.0170$.

b For weight of phloroglucide between 0.03 Gm. and 0.30 Gm.: Kröber's table is used.

Kröber's method was applied to commercial aloin and also to Barbadoes aloe with the following results:

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	5.4344 Gm.	0.0207	0.0263	0.0048
Barbadoes aloe	6.7921	0.0214	0.0271	0.0040
Barbadoes aloe	10.1710	0.0287	0.0345	0.0034

The amount of pentose shown here is very small. It may occur free in the aloin or aloe or it may be formed by hydrolysis during the process.

Various methods were tried in the attempt to hydrolize aloin. Commercial aloin and Barbadoes aloe were refluxed separately with 3% hydrochloric acid for four hours, the acid content was raised to 12% and the amount of pentose determined as above.

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	6.4136 Gm.	0.0244	0.0301	0.0047
Barbadoes aloe	5.7726	0.0214	0.0271	0.0047
Barbadoes aloe	10.4554	0.0318	0.0411	0.0040

The amount of pentose found is approximately the same as in the case where no preliminary heating with acid was done, and it may be concluded that no hydrolysis of aloin takes place under such conditions.

Commercial aloin was placed in a flask and 100 cc. of alcohol containing 3% hydrochloric acid were added. The flask was connected to a reflux condenser and the mixture refluxed by heating on a water-bath for four hours. The alcohol was distilled off, 100 cc. of 12% hydrochloric acid added and pentoses determined. The process was repeated with Barbadoes aloe.

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	1.0179	0.0085	0.0139	0.0134
	1.1351	0.0098	0.0152	0.0134
Barbadoes aloe	3.7751	0.0363	0.0460	0.0122
	4.2682	0.0396	0.0497	0.0116

The amount of pentose found is still very small and indicates only incomplete hydrolysis of the aloin.

Commercial aloin was placed in a flask and 100 cc. of 3% potassium hydroxide solution added. The flask was connected to a reflux condenser and heated for four hours. The potassium hydroxide was neutralized with concentrated hydrochloric acid and enough hydrochloric acid added in addition to bring the acid content to 12%. Arabinose was then determined. The process was repeated with Barbadoes aloe.

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	0.9543	0.0068	0.0122	0.0128
	0.9891	0.0073	0.0127	0.0128
Barbadoes aloe	4.0475	0.0210	0.0266	0.0066

The results obtained here are approximately the same as those in which 3% hydrochloric acid in alcohol was used.

Commercial aloin was placed in a flask and 100 cc. of alcohol containing 3% potassium hydroxide added. The flask was connected to a reflux condenser and heated over a water-bath for four hours. The potassium hydroxide was neutralized with hydrochloric acid and the alcohol distilled off. One hundred cc. of 12% hydrochloric acid were added and the arabinose determined. The same procedure was repeated with Barbadoes aloe.

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	0.9853	0.0146	0.0201	0.0205
	0.9647	0.0176	0.0232	0.0240
Barbadoes aloe	3.7711	0.0328	0.0421	0.0112

If the molecular weight of aloin is taken as 402 and that of arabinose as 150, the equivalent for converting arabinose to aloin becomes 2.680. The per cent aloin hydrolyzed is found by multiplying the weight of arabinose per Gm. of substance used by 2.68×100. In the first determination, $0.0205 \text{ Gm.} \times 2.68 \times 100 = 5.49$ per cent; in the second determination, $0.0240 \text{ Gm.} \times 2.68 \times 100 = 6.43$ per cent. The hydrolysis of the aloin was not complete by this method.

Mild oxidizing agents were next used to split off the pentose. Commercial aloin was dissolved in 75 cc. of water and the solution boiled. Sodium peroxide was added in small portions, the alkali formed neutralized with hydrochloric acid and the acid content raised to 12%. The pentose was then determined. This procedure was repeated with Barbadoes aloe.

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	0.8275	0.0240	0.0297	0.0358
	0.8756	0.0220	0.0277	0.0317
Barbadoes aloe	2.4422	0.0134	0.0169	0.0078
	1.8526	0.0111	0.0166	0.0089

In the case of commercial aloin, 0.0356 Gm. pentose per Gm. material taken is equivalent to 9.59% aloin; 0.0317 Gm. pentose is equivalent to 8.50% aloin.

Commercial aloin was dissolved in 75 cc. of water and the solution boiled. Five grams of sodium perborate were added in divided portions to the boiling liquid. The alkali formed was neutralized with hydrochloric acid, the acid content brought to 12% and the pentose determined. The method was repeated with Barbadoes aloe.

Substance.	Wt. Taken.	Phloroglucide.	Pentose.	Pentose per Gm.
Commercial aloin	0.8795	0.0904	0.1055	0.1195
	0.8788	0.0760	0.0897	0.1021
Barbadoes aloe	2.7340	0.0674	0.0802	0.0293
	3.4388	0.0726	0.0860	0.0250

In the case of commercial aloin, 0.1195 Gm. arabinose is equivalent to 32.0% aloin; 0.1021 Gm. arabinose is equivalent to 27.4% aloin. For Barbadoes aloe, 0.0293 Gm. arabinose indicates 7.8% aloin; 0.0250 Gm. indicates 6.7%. These results are not sufficiently high to warrant the use of the method as a quantitative determination of the aloin present.

SUMMARY.

1. A laboratory review of the methods proposed by previous investigators shows that, at present, there is no satisfactory method for the evaluation of aloe or for the quantitative determination of the aloin present.

2. The configuration of aloin suggests a method for its determination, namely, by hydrolizing the aloin so as to split off aloe-emodin and arabinose (a five-carbon-atom sugar). The arabinose is then converted to furfural which is precipitated by means of phloroglucinol.

3. The attempted hydrolysis of aloin with 3% hydrochloric acid in water showed no appreciable hydrolysis.

4. The use of 3% hydrochloric acid in alcohol in the attempt to hydrolize aloin showed only slight hydrolysis.

5. The attempted hydrolysis of aloin with 3% potassium hydroxide in water gave no better results.

6. The hydrolysis attempted with 3% potassium hydroxide in alcohol was very incomplete.

7. Treatment with sodium peroxide indicated the splitting off of arabinose from approximately 9% of the aloin.

8. Treatment with sodium perborate indicated the decomposition of approximately 30% of the aloin.

9. The work of Grönewold (10), who prepared a tri- and a hexa-acetyl derivative, suggests the possibility of determining aloin by acetylization, whereby acetyl groups replace the hydroxyl groups found in the aloin molecule. The precipitated acetyl derivative would be washed free from acetic anhydride, the acetyl groups liberated as potassium acetate by refluxing with alcoholic potassium hydroxide. Excess sulphuric acid would be added and the acetic acid distilled into a volumetric sodium hydroxide solution and the excess titrated with sulphuric acid. The amount of sodium hydroxide neutralized indicates the number of acetyl groups introduced. From preliminary work on this method, it would appear to be worthy of further study.

BIBLIOGRAPHY.

(1) U. S. Pharmacopœia, Tenth Revision, page 41.
(2) Bainbridge and Morrow, *Pharm. J.*, 49 (1890), 570.
(3) Cripps and Dymond, *Ibid.*, 44 (1885), 633.
(4) Stacy, *Analyst*, 41 (1916), 75.
(5) Klunge, *Arch. Pharm.*, 221 (1883), 363.
(6) Tschirch, "Handbuch der Pharmacog.," II, 2—page 1425.
(7) Tschirch and Klaveness, *Arch. Pharm.*, 1901, 231 and 241.
(8) Tschirch and Aschan, *Ibid.*, 1903, 340.
(9) Tilden, *Pharm. J.*, 1875, 208.
(10) Grönewold, *Arch. Pharm.*, 1890, 115.
(11) Shenstone, *Pharm. J.*, 1882, 462.

(12) Tschirch, "Handbuch der Pharmacog.," II, 2—page 1433.
(13) Formanek, *Zeitsch. Anal. Chem.*, 1897, 409.
(14) Leger, *Jour. Pharm.*, 1902, 335.
(15) Kremel, *Pharm. Post*, 1895, 422; *Pharm. Zentrlh.*, 37, 656.
(16) Tschirch, *Ber. d. d. pharm. Ges.*, 1898, 196.
(17) Oesterle, *Arch. Pharm.*, 1889, 81.
(18) Schunck, *Lieb. Ann.*, 1841, 1 and 65; 1848, 234.
(19) Stenhouse, *Ibid.*, 1851, 208.
(20) Liebermann and Giesel, *Ber. d. Chem. Ges.*, 1875, 1643; 1876, 329.
(21) Seel, *Ibid.*, 1900, 3212; *Südd. Apoth.-Zeit.*, 1906, 624.
(22) W. Scharf, "Oxydationsprod. d. Aloebestandth. mit Caroscher Säure," Diss. Zurich, 1909.
(23) Tschirch and Pedersen, *Arch. Pharm.*, 1898, 206.
(24) Rochleder and Czumpelik, *Chem. Zentralblatt*, 1863, 606; 1866, 29.
(25) Aweng, *Apoth. Zeit.*, 1902, 422.
(26) Tschirch and Hoffbauer, *Schweiz. Woch. Chem. Pharm.*, 1905, 43, 153.
(27) Tilden, *Jahresber. d. Fortschritte d. Pharm.*, 1871, 15.
(28) Plenge, *Pharm. J.*, 1884, 44, 330.
(29) Schäfer, *Pharm. Zeit.*, 1897, 42, 95.
(30) Leger, *J. pharm. chim.*, 6 (1902), 15, 519.
(31) v. Itallie, *Pharm. Weekblad.*, 1905, 42, 553.
(32) Kröber, *J. Landw.*, 1900, 379.

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CHEMICAL AND PHYSICAL DETERMINATIONS ON THE GUM AND VOLATILE OIL OF ASAFŒTIDA.

BY JOSEPH F. CLEVENGER.*

It has been apparent for some time that the method of assay of asafœtida and the requirements for that product, as given in the U. S. P. X, are not entirely satisfactory. The New York Station has recently made a study of the subject and as a result has adopted a method of assay which gives figures that appear to be a truer measure of the quality of the drug.

To obtain information to serve as a basis for suggesting a suitable quality standard for asafœtida, each of 41 lots of the gum offered for entry at the port of New York during the past three years was analyzed. Samples were made uniform by passing them through a meat grinder and for the determinations of alcohol-soluble extractive, acid-soluble ash, moisture content and yield of volatile oil the following methods were adopted:

ALCOHOL-SOLUBLE EXTRACTIVE.

Weigh 10 Gm. of the sample in a tared 250-cc. Erlenmeyer flask. Add 100 cc. of alcohol. Attach a reflux condenser and boil for one hour or until the sample is completely disintegrated. Dry a filter paper in an oven at 110° C., cool and weigh. Fit the paper in a Buchner funnel of slightly smaller diameter so that the edges turn up approximately one-fourth of an inch. Filter the gum and alcohol hot, under suction, taking care not to fill the Buchner funnel above the edges of the filter paper. Wash with hot alcohol until no cloudiness is produced when the filtrate is

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dropped into water. Remove the filter paper containing the residue, roll it and return it and contents to the tared flask, avoiding the loss of any of the residue. Dry at 110° C. to constant weight (over night drying is sufficient). The difference between the weight of the sample and the sum of the weights of the residue and the water, determined by the xylol or toluol method[1] is the weight of the alcohol-soluble extractive.

VOLATILE OIL.

Transfer 50 Gm. of the sample to a 500-cc. short-neck flask. Set up apparatus as illustrated in Fig. 1. The distillation is carried to complete exhaustion and should be conducted at a rate sufficiently slow to avoid the escape of vapors around the condensers and consequent loss of volatile oil.

The yield, specific gravity, optical rotation and refractive index of the volatile oil were determined as outlined by Clevenger.[2]

The sulphur content of the volatile oil was determined as follows:

SULPHUR.

Place approximately 0.5 Gm. of the volatile oil, weighed accurately, into a 150-cc. acetylization flask. Through the condensing tube add 5 cc. of water, then 5 cc. of concentrated nitric acid. Heat gently on the steam-bath until the reaction is started, then set aside in hood until the reaction has practically subsided. Add 3 Gm. of powdered potassium bromide through the condenser tube, then heat on the steam-bath for 20 minutes and cool. Add 10 cc. of 50 per cent sodium hydroxide solution through the condensing tube. Disconnect the condenser from the flask, transfer the contents to a nickel crucible, carefully evaporate to dryness and ignite. Dissolve the residue in water, remove nitrous and nitric acids by evaporation with hydrochloric acid and determine the sulphur as barium sulphate.

Of the 41 lots of asafœtida examined the following are typical:

TABLE I.—RESULTS OBTAINED BY PRECEDING METHODS.

Source.	Alcohol-Soluble Extract,[1] Per Cent.	A. I. A., Per Cent.	Moisture, Per Cent.	Volatile Oil. Cc. per 100 Gm.	Sp. gr. 20° C./20° C.	Op. rot. 20° C.	Ref. ind. 20° C.	Sulphur,[1] per cent.
Bombay	60.4	1.4	4.9	11.5	0.973	−9.0	1.518	22.4
Bombay	74.7	2.9	2.7	8.0	0.942	−4.5	1.510	28.0
Bombay	59.1	6.9	4.3	9.2	0.915	+6.3	1.495	18.9
Bombay	58.1	9.6	4.4	8.6	0.910	+9.3	1.495	18.2
Aden	60.3	1.7	4.4	9.0	0.928	+4.5	1.498	18.0
Bombay	54.5	4.6	2.8	7.5	0.927	+3.5	1.497	15.6
Bombay	57.0	4.9	4.6	7.8	0.920	+4.1	1.497	15.8
Bombay	61.0	3.7	3.8	8.0	0.908	+8.7	1.493	17.9
Bombay	58.6	6.1	8.0	9.5	0.922	+3.8	1.498	29.0
Bombay	63.9	6.0	4.3	10.0	0.921	+5.5	1.497	19.8
Bombay	70.2	3.6	3.6	9.0	0.935	+2.7	1.504	18.4
Bombay	58.5	7.2	3.8	11.0	0.906	+8.0	1.493	17.9
Bombay	63.0	12.9	4.0	12.0	0.929	+2.1	1.501	22.9
Bombay	59.6	4.4	4.3	10.0	0.960	−9.0	1.509	15.3
Bander Abbas	58.9	3.4	11.8	9.5	0.933	+7.3	1.497	19.6

[1] Determinations were made by O. C. Kenworthy; J. A. Batscha and J. A. Reilly, chemists in drug laboratory.

[1] Book of Methods of the A. O. A. C., 1930, page 227.

[2] JOUR. A. PH. A., 17 (1928), 345.

CONCLUSION.

The only assay so far recognized for gum asafœtida is alcohol-soluble extractive. The assay prescribed in U. S. P. IX was indirect and consisted in the determination of the alcohol-insoluble residue from which the alcohol-soluble extractive was calculated. The method was faulty in that the moisture content which was included could not be called properly alcohol-soluble extractive.

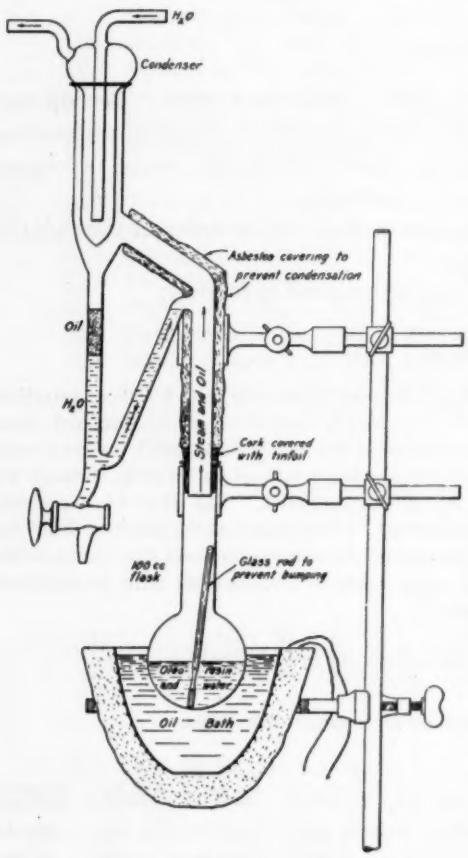

Fig. 1.

On the other hand, the assay in U. S. P. X is direct in that the alcohol-soluble extractive is dried to constant weight. The method is faulty in that an undetermined proportion of the volatile oil is lost and the resulting values for alcohol-soluble extractives are too low.

The method of assay adopted by the New York Station is similar to one used by Bennett and Bickford[1] in determining the alcohol-soluble extractive in gum benzoin and is essentially that given in U. S. P. IX with suitable corrections for moisture.

Since the volatile oil constitutes from 10 to 19 per cent of the alcohol-soluble extractive and since there is a probability of loss of volatile oil in certain manufacturing processes, it is recommended that in addition to the requirement for alcohol-soluble extractive a suitable volatile oil standard for asafœtida be adopted in the forthcoming U. S. P.

TURBIDIMETRIC MEASUREMENTS FOR PHARMACEUTICAL PREPARATIONS.*

BY SAMUEL CLAMAN, C. JELLEFF CARR AND JOHN C. KRANTZ, JR.

INTRODUCTION.

Clarity Standards for pharmaceutical preparations serve a twofold purpose. *First*, they insure that solutions intended for intravenous medication are free from insoluble particles. *Second*, they enable the establishment of a high degree of pharmaceutical elegance in such preparations as the elixirs and waters. In conformity with this view the new Netherlands Pharmacopœia makes the requirement:

[1] *Jour. A. O. A. C.*, 11 (1928), 386.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Miami meeting, 1931.

By clear is understood that the liquid or solution does not appear more turbid than a suspension of 5 mg. of particles (with the largest diameter of the particles 20 microns) per liter. The comparison of clarity is carried out in tubes with flat, colorless bases, with a discernible (or penetration) length of at least 10 cm. and against a dull black background.

In the preparation of the general monographs for the forthcoming revision of the United States Pharmacopœia an effort was made to prepare standards of turbidity and clarity and to develop a suitable criterion of measurement of small difference in turbidity.

EXPERIMENTAL.

In search for a suitable standard of turbidity the standards adopted by the United States Geological Survey in the standardization of the turbidity of water was employed. The standard for comparison is prepared by suspending 1 Gm. of dry, precipitated, fuller's earth, sifted through a 200-mesh sieve into 1000 cc. of distilled water. This stock suspension has a turbidity of 1000. Standards for suspensions of a lesser degree of turbidity may be prepared from this stock suspension by dilution with distilled water after thorough agitation. Thus 1 cc. of this suspension diluted to 100 cc. with distilled water produces a suspension with a turbidity of 10, whereas 1 cc. of the stock suspension diluted to 1000 cc. produces a suspension with a turbidity of one. Turbidities of less than one can be obtained by further dilution.

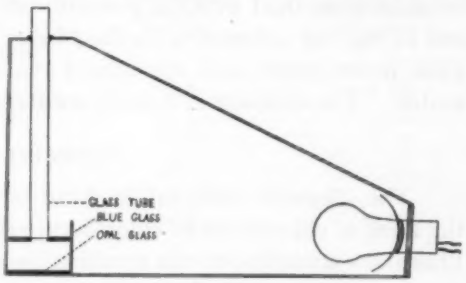

Fig. 1.

The authors have found these turbidity standards very useful in measuring the degree of clarity of solutions which have passed through various filtering media and also in determining the amount of insoluble impurities in solutions of medicinal salts. Ordinary tap water generally has a turbidity of less than one; elixirs and aromatic waters, when filtered properly, should not have a turbidity exceeding one unit on the fuller's earth scale.

The next problem was one of selecting a suitable turbidimeter for the rapid measurement of these turbidities. For this purpose the authors found the Baylis Turbidimeter[1] (with certain minor modifications) admirably suited; an outline drawing of the apparatus is given in Fig. I. The principle upon which the instrument depends is exceedingly simple. The blue light shines from beneath the glass tubes so that the observer sees only blue light if the solution contains no suspended particles. Any suspended matter reflects white light rays and obscures some of the blue light. With tubes containing 50 cc. of liquid (Nessler Tubes) a turbidity of 10 will obscure most of the blue light.

CONCLUSION.

1. Turbidity standards and measurements are described which are applicable to pharmaceutical preparations.

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MARYLAND STATE DEPARTMENT OF HEALTH.

[1] J. R. Baylis, *Ind. Eng. Chem.*, 18 (1926), 311.

THE TITRATION OF CERTAIN ALKALOIDS.

BY M. G. MELLON AND J. TIGELAAR.

For the titrametric determination of the alkaloids atropine, brucine and strychnine, through the addition of an excess of standard acid and the back titration with a base, the edition of 1925 of the U. S. Pharmacopœia specifies the use of methyl red as an indicator.

Since the date of compiling most of the material for the last edition of these standard methods a number of investigations have been published[1] dealing with the determination of various alkaloids by means of several methods. On the basis of the data presented various individuals have drawn quite different conclusions regarding the indicators which should be used in making volumetric titrations. Because of this disagreement Dean C. B. Jordan[2] suggested to the writers that determinations be made of certain of the alkaloids with the idea of trying some of the different procedures proposed in order to determine whether any recommendation for a change should be made in the forthcoming edition of the Pharmacopœia.

The work undertaken had the following objectives: to check the ordinary volumetric method with the potentiometric method using a quinhydrone electrode; and to run the volumetric method using both the indicators recommended by previous investigators and any others available whose p_H ranges seemed likely to be usable. The alkaloids selected were atropine, brucine and strychnine.

EXPERIMENTAL WORK.

The alkaloids were in the form of commercially prepared white solids or in the form of chloroform or chloroform-ether extracts prepared in the local School of Pharmacy according to the specifications of the U. S. Pharmacopœia. Solutions of approximately 0.1 *N* hydrochloric and sulphuric acids and 0.0200 *N* sodium hydroxide were prepared with the usual analytical precautions. The solutions of the indicators were prepared according to the directions of Clark.[3] A solution of modified methyl red was made by dissolving 1.25 Gm. of methyl red and 0.825 Gm. of methylene blue in a liter of 90% ethanol.[4]

For the potentiometric titration a L. and N. student potentiometer was used together with normal calomel and quinhydrone electrodes connected with a salt bridge containing potassium chloride.

For making titrations a weighed sample was dissolved in the smallest possible

[1] J. Evers, JOUR. A. PH. A., 10 (1921), 676; Herzig, *Arch. Pharm.* (1921), 249, 259, 308; Holt and Kahlenberg, JOUR. A. PH. A., 20 (1931), 11; Kolthoff, *Bilochem. Z.*, 162 (1925), 289, JOUR. A. PH. A., 14 (1925), 298, *Pharm. Weekblad*, 62 (1925), 287, 478, *Z. anorg. allgem. Chem.*, 112 (1920), 196; Krantz, JOUR. A. PH. A., 14 (1925), 294, 19 (1930), 1299; Maricq, *Bull. soc. chim. Belg.*, 38 (1929), 265, 426; Masucci and Moffat, JOUR. A. PH. A., 12 (1923), 609; McGill, *J. Am. Chem. Soc.*, 44 (1922), 2156, JOUR. A. PH. A., 11 (1922), 1003; North and Beal, JOUR. A. PH. A., 13 (1924), 889, 1001; Popoff and McHenry, *Ind. Eng. Chem.*, 20 (1928), 534, JOUR. A. PH. A., 14 (1925), 473; Prideaux and Winfield, *Analyst*, 55 (1930), 561; Rasmussen and Schou, *Z. Electrochem.*, 31 (1925), 189; Treadwell and Janet, *Helv. Chim. Acta*, 6 (1923), 734; Wagener and McGill, JOUR. A. PH. A., 14 (1925), 288; Wales, *Ind. Eng. Chem.*, 18 (1926), 390.

[2] School of Pharmacy, Purdue University; Chairman of Sub-Committee on Proximate Assays of the Committee of Revision of the U. S. Pharmacopœia.

[3] Clark, "Determination of Hydrogen Ions" (1928), 92, 94.

[4] Johnson and Green, *Ind. Eng. Chem., Anal. Ed.*, 2 (1930), 2.

amount of neutral, 95% ethanol or directly in the standard acid. About 1 ml. more than the calculated equivalent amount of acid was added and the solution diluted to about 75 ml. After adding one or two drops of the desired indicator, the solution was titrated back with the standard base to the proper end-point. From the actual and the theoretical amount of acid required for the formation of the alkaloidal salt the percentage purity was determined. This value depends both upon the p_H ranges of the different indicators and the actual color change selected by the analyst to mark the end-point. In several cases both hydrochloric and sulphuric acids were used but with no more variation than might be expected from the experimental error. The mean value calculated for the percentage purity is the average of three to twelve separate determinations. Samples of approximately 0.4 Gm. were used.

The results obtained for the alkaloids atropine, brucine and strychnine are shown in Table I.

TABLE I.—RESULTS OBTAINED IN THE TITRATION OF VARIOUS ALKALOIDS USING DIFFERENT INDICATORS.

Indicator.	p_H Range.	Mean Value for Purity Per Cent.	Variation from Mean, Per Cent.
	Atropine.		
Brom phenol blue	3.0–4.6	99.57	±0.20
Brom cresol green	4.0–5.6	98.73	0.30
Methyl red	4.4–6.0	98.67	0.10
Modified methyl red	4.4–6.0	98.70	0.11
p-Nitrophenol	5.0–7.0	98.39	0.11
Brom cresol purple	5.2–6.8	98.51	0.12
	Brucine.		
Brom phenol blue	3.0–4.6	98.51	0.09
Brom cresol green	4.0–5.6	97.76	0.10
Methyl red	4.4–6.0	96.96	0.06
Modified methyl red	4.4–6.0	97.03	0.18
p-Nitrophenol	5.0–7.0	96.85	0.09
Chlor phenol red	5.0–6.6	96.49	0.16
Brom cresol purple	5.2–6.8	96.36	0.08
	Strychnine.		
Brom phenol blue	3.0–4.6	99.45	0.30
Methyl red	4.4–6.0	98.40	0.14
Modified methyl red	4.4–6.0	98.45	0.10
Chlor phenol red	5.0–6.6	98.03	0.09
Brom cresol purple	5.2–6.8	97.81	0.16

Atropine was titrated as soon as possible after being dissolved. No heat was applied to aid the process of solution as such procedure rendered checking titrations difficult to obtain. Kolthoff[1] called attention to the instability of such a solution.

In attempting to titrate colchicine indigo carmine was used as an indicator. The color change was not sharp and the amount of alkali required in the back titration indicated that an alkaloidal salt was not formed with the acid, thus confirming the reports of others on this point.

[1] *Biochem. Z.*, 162 (1925), 289.

All of the above results were obtained on commercial material which was practically white. Since it seemed desirable to determine whether determinations could be made with indicators on material not so well purified, samples were titrated which had been made by students by extracting crude nux vomica and belladonna following the method of the U. S. Pharmacopœia. The solutions were more or less yellowish in hue. In both cases the end-points with modified methyl red were distinct, the results agreeing among themselves for each alkaloid within about five parts per thousand. With belladonna the color changes with brom cresol green and brom cresol purple were distinct, but *p*-nitrophenol was useless.

Following essentially the procedure of Rasmussen and Schou[1] potentiometric determinations were run by dissolving the commercial alkaloid in a small excess of standard acid, diluting to about 100 ml. and titrating back with sodium hydroxide, using normal calomel and quinhydrone electrodes. Plotting the p_H values as ordinates and the volume of base as abscissas, the results are shown in Fig. 1. The results in each case are the average of about seven determinations, the deviation from the mean being not more than 0.1 p_H units. In the curves the chief items of interest are the location, the slope and the length of the nearly vertical portions.

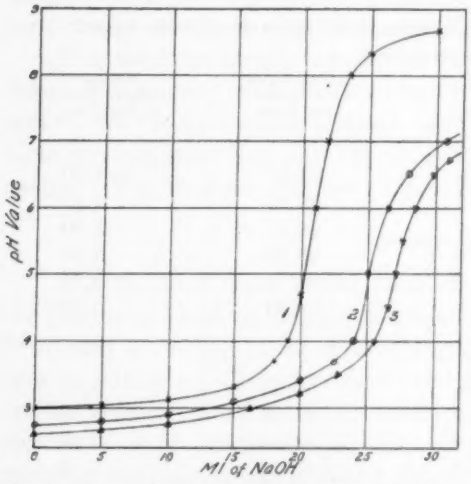

Fig. 1.—Curves for the titration of (1) atropine, (2) strychnine and (3) brucine.

DISCUSSION AND SUMMARY.

Being free from interference by color in the solutions titrated and being largely independent of the judgment of the analyst as to where the end-point occurs, potentiometric determinations are probably more generally applicable; but for commercial analyses the method is not as simple and rapid as the usual volumetric procedure. The latter is preferable, therefore, as long as the results obtained lie within reasonable limits of precision.

An inspection of the curves shown in Fig. 1 indicates the approximate transformation range indicators should have to be suitable for the titration of the three alkaloids studied. Taking the mid-way point of the nearly vertical portion of the curves, the end-point would be for atropine at a p_H value of about 6 and for brucine and strychnine about 5. As far as their transformation ranges are concerned, methyl red and brom cresol green seem to be the best for brucine and strychnine and brom cresol purple for atropine. As all the indicators mentioned in Table I except modified methyl red have yellow as either their acidic or basic color, they have a common defect if the solution to be titrated is itself yellowish. Although methyl red has not quite the best p_H range for the titration of atropine, the error involved in its use in determining the small amount of active constituent present in crude drugs would be small.

[1] *Z. Elektrochem.*, 31 (1925), 189.

The divergence of results shown in Table I for any one alkaloid indicates the desirability of specifying some one indicator if concordant values are to be obtained. The variations shown are to be explained presumably by one or both of the following factors: the different transformation ranges of the indicators, and the actual hue selected by the analyst to mark the attainment of the end-point of the titration. In the latter connection, modified methyl red has a distinct advantage in having near the center of its transformation range a more or less neutral hue which may be taken as the end-point.

In view of the satisfaction which modified methyl red has given in this Laboratory for any titrations in which methyl red is applicable, and in view of the advantage which it seems to possess for the titration of the alkaloids studied, the writers recommend that it be specified as the preferable indicator for use in the determination of atropine, brucine and strychnine. The potentiometric method, using a quinhydrone electrode, should be considered as an alternative procedure.

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MICROBIOLOGY VERSUS BACTERIOLOGY.*

BY FANCHON HART.

The term "microbiology" was adopted because it represents most adequately the study of those biologicals concerned with micro-organisms. We might have called the subject biological materia medica, but that would not differentiate it from the study of the glandular products used in medicine.

While an outline of the course would seem to indicate that the topics under consideration are similar to those of Applied Bacteriology, the subject matter, mode of presentation, as well as the methods to be used should be the factors which bear out the objectives of the curriculum.

Microbiology has found its way into the pharmacy curriculum because a knowledge of the subject has become as essential to the pharmacist as an applied course in bacteriology is for the medical student. And right here I would like to state my disapproval of the introduction of a medical course in bacteriology for those intending to minister to the public needs in the sole capacity of retail pharmacist. To my knowledge, the practicing pharmacist is not called upon to make diagnostic tests. He has neither the equipment nor background for this type of technical work. The Board of Health of New York City clearly recognizes this fact in that it not only demands a B.S., but in addition, requires that the applicant, for a permit to undertake this work, show his ability through a searching and specific examination subsequent to an inspection of his laboratory.

On the other hand, preventive medicine, rather than therapeutic medicine is making itself felt, and even growing in use and appreciation as the public becomes more aware of its rightful share of good health and wholesome living conditions. The physician, with rare exceptions, no longer meets with opposition at the suggestion of prophylactic treatment for the exposed members of the family;

* Scientific Section, A. PH. A., Miami meeting, 1931.

viz., vaccination of the school child, anti-rabies virus for the dog-attacked youngster or typhoid inoculations at the rumor of a near-by polluted stream. The dispenser of remedies must of necessity be fully armed with all the available information concerning the comparatively new and ever-increasing biological aids in the treatment of contagious diseases.

I have planned our course with three objectives in view.

1. To give the student a basic knowledge of the bacteriological biological articles which he may be called upon to dispense in the retail trade.

2. Sanitation, personal and community hygiene. It is our aim to develop by means of this objective, the realization of the urgent need for thorough cleanliness of the individual as well as in the matter concerning the profession.

3. A knowledge of the more recent aids in preventive medicine; such as the use of anti-venin, allergy and non-specific protein therapy, etc.

The First Objective.

TEACHING METHODS USED.

The lecture-demonstration method has met with the greatest success for our work. As aids to the lectures, we make use of charts, graphs, illustrations, practical demonstrations wherever possible, micro-photographs and occasional supplementary lectures by representatives of the leading biological manufacturing houses.

Orientation is made possible by preview discussion periods, previous to the lectures. At our first gathering of the class, many prejudices and erroneous ideas are cleared up at once. New concepts are launched for some, through the easy informal discussions at our early meetings. Incidentally, a census is taken in order to ascertain the amount and kind of store experience the members of the class have had up to this time. Of course, those who have worked in stores with Board of Health stations readily demonstrate to the class the practical aspect of the course. This leads us easily to the question: "What preparations are most frequently called for?" The answers invariably decide the topical order of the items under consideration throughout the first unit (objectives).

All commercial biologicals, including antitoxins, vaccines, serums, extracts, toxins, etc., are given the following consideration:

1. The annual death rate (for the past 50 years) caused by the disease for which the preparation is used.
2. Causes of infection.
3. History of the organism.
4. Morphology and cultural properties of the organism.
5. Means of identification of the organism as well as the disorder.
6. Modes of transmission.
7. Preventive control.
8. Therapeutic (biological) treatment.
9. Methods of manufacture of the commercial products.
10. Standardization and dosage.

The Second Objective.

The second (objective) unit deals with and considers the various methods of sterilization and disinfection. Sewage disposal, food and water inspection and

the causes of epidemics and pandemics make up a large part of the subject matter of this phase of the work.

Lecture discussion periods are held on the protozoal and fungal parasites, as well as the modern methods for community control of the diseases of which they are the cause. Lecture and laboratory methods are used in the study of the changes brought about in the blood by many of these parasites. The student is given the opportunity of making his own blood smears to be compared with lantern projection of micro-photographs of pathogenic blood.

In order to more fully acquaint the members of the class with the most recent literature concerning microbiology, each student is advised to select for special investigation, a topic of greatest interest to him. Some few prefer an assignment from the instructor. These "research" problems are written with the understanding that they be inspirational. All old stuff will not go, except as a preliminary review of the subject dealt with. The reports are delivered orally before the class, it being understood that at the conclusion of each report, discussions and questions may follow. Naturally, the student is only asked to defend his own statements or give the authority for the same. Among the topics chosen last year were: psittacosis, antibacterial serums, allergy, tuberculins, complement fixation, poliomyelitis, toxoids, diagnostic tests, yellow fever, bacteriophage and cancer. Each report is neatly written, in good form, and includes a substantial bibliography. The study is filed away for future reference.

The Third Objective.

The latter part of the course is devoted to lectures and discussions of the more recent aids employed in preventive medicine.

We have been fortunate in being able to secure assistance (from a well-known biological house) for the demonstration of venom extraction from rattlers and the action of anti-venin on venom-inoculated birds. An authority on hay-fever and asthma has been kind enough to offer his services in the way of lectures on allergic asthma, hay-fever and ivy poisoning.

Upon completion of the course, such salient material as the phenomena of immunity, opsonins and non-specific protein therapy are adequately covered.

The final examination, one of four compulsory tests, is here appended, in order to more fully convey the scope and contents of the course.

Second Year — Materia Medica 59–60
College Class — Microbiology — May 11, 1931.

Instruction: Copy only the *one word* or *phrase* which represents the correct answer.

1. Increase in temperature is, in the case of typhoid, (*a*) dangerous; (*b*) fatal; (*c*) a syndrome; (*d*) contagious; (*e*) improvement.
2. The potability of water is determined by (*a*) source; (*b*) temperature; (*c*) clarity; (*d*) bacterial count; (*e*) odor.
3. Organisms that cause disease because of their presence in drinking water are called (*a*) typhoid bacilli; (*b*) water-borne organisms; (*c*) aqueous cultures; (*d*) filterable viruses; (*e*) sewage bacteria.
4. Hookworms gain entrance into the human body by means of (*a*) assimilation of decayed meat; (*b*) consumption of canned vegetables; (*c*) contact with hookworm carrier; (*d*) poor ventilation; (*e*) soil infection.
5. African sleeping sickness is conveyed by (*a*) species of stegomyia; (*b*) tsetse-fly; (*c*) anopheles; (*d*) culex; (*e*) rats.

6. Spirochæte pallidum is (*a*) trypanosome; (*b*) filterable virus; (*c*) saprophytic spirillum; (*d*) roundworm; (*e*) diplococcus.
7. The tubercle bacillus was discovered by (*a*) Neisser; (*b*) Pasteur; (*c*) Koch; (*d*) Calmetti; (*e*) Pappenheim.
8. Pollacine is a (*a*) pollen toxin; (*b*) hay-fever antidote; (*c*) pollen fever; (*d*) unit dose; (*e*) cutaneous test.
9. In acute infections, three stages of fever can be distinguished. The first is the (*a*) fastigial; (*b*) pyrogenetic; (*c*) defervescent.
10. Intermittent fevers are characteristic of (*a*) tuberculosis; (*b*) typhoid; (*c*) diphtheria; (*d*) malaria; (*e*) leprosy.
11. Tuberculosis of the spine is known as (*a*) consumption of the spine; (*b*) lupus; (*c*) Pott's disease; (*d*) scrofula; (*e*) spinal meningitis.
12. The greatest danger of tuberculosis infection to man is due to (*a*) consumption of raw milk; (*b*) unwholesome diet; (*c*) poor sanitation; (*d*) coughing and spitting; (*e*) eating of infected meat.

Instruction: Complete the following statements by as few words as possible.

13. Resistance against tuberculosis can be increased by
14. The Dick test is used to determine
15. The Schick test is used to determine
16. Anti-snakebite serum is used to
17. Organisms which give rise to pus formation are known as
18. Vaccine virus is obtained from previously inoculated
19. Anti-rabic vaccine virus is obtained from
20. Rabies virus is made avirulent by
21. Active immunization for animals against anthrax is brought about by the injecting of
22. The curative dose of tetanus antitoxin is units
23. How many units are contained in the protective dose of tetanus antitoxin?
24. Diphtheria antitoxin is marketed in dosage from to
25. State the unit of tetanus antitoxin.
26. State the official Latin title of diphtheria antitoxin.
27. What is the unit of diphtheria antitoxin?
28. All extracts or suspensions of the tubercle bacilli are known as
29. The four known strains of Bacillus tuberculosis are
30. Which of the following substances are used as prophylactics? (*a*) tetanus antitoxin; (*b*) Koch's old tuberculin; (*c*) vaccine variole; (*d*) diphtheria antitoxin; (*e*) pertussis vaccine.
31. State the causative agents of each of the following: (*a*) whooping cough; (*b*) typhoid fever; (*c*) scarlet fever; (*d*) botulism; (*e*) pneumonia.
32. Diagramatically show the morphological character of each of the following: (*a*) bacilli; (*b*) diplococci; (*c*) spirilla; (*d*) streptococci; (*e*) flagellated bacillus.
33. State the botanical name of the causative agent of typhoid fever.
34. State how the above may gain entrance into the body.
35. What is the incubation period for typhoid fever?
36. Is the biological preparation for typhoid fever used prophylactically, therapeutically or both?
37. Are typhoid epidemics ever caused by carriers?
38. How many doses of typhoid vaccine are given for prophylactic treatment?
39. How is typhoid vaccine administered as to time intervals between doses?
40. What organism does Typhoid Mixed Vaccine contain?
41. What is the purpose of the Widal test?
42. When is the Widal test carried out?
43. What is a filterable virus?
44. What is the antigen causing hay-fever?
45. State briefly the composition of the following types of vaccines: (*a*) autogenous; (*b*) polyvalent; (*c*) mixed; (*d*) univalent; (*e*) sensitized.
46. What are the four modes of administering tuberculin?

47. State five methods which might be employed in the sterilization of live cultures.
48. Would all the above methods be equally effective in the preparation of attenuated cultures?
49. State *only* the *essential* differences in the manufacture of antibacterial sera and antitoxins.
50. State how attenuation differs from sterilization.

BACTERIOLOGY.

The course in Applied Bacteriology is given to the candidates for the B.S. in Pharmacy only. Its purpose lies in the training of students for this portion of clinical analysis. Non-pathogenic organisms of economic importance as well as the disease-producing bacteria and protozoa are included in the curriculum.

Periodicals and texts are readily available for student use. Each member of the class is expected to read of the history and discoveries of the various organisms and discuss their readings intelligently in class.

The first part of the course is devoted to the morphological and cultural properties of the various micro-organisms. The latter portion is purely applied in nature and includes the bacteriology of water, sewage, air, soil, milk, excreta, sputum, spinal fluid and blood.

All members of the class participate in the carrying out of the Widal test as well as other agglutination reactions, the preparation of autogenous vaccines and the determination of disinfectant coefficient of liquids, ointments, tooth-pastes and inhalants.

The following methods of presentation are observed:

A. Discussion-demonstration hours covering the morphological and cultural properties of the pathogenic and non-pathogenic micro-organisms.

Formal lectures are largely replaced by lecture-discussion periods. At the first lesson, the class is introduced to the general plan of the course. An outline consisting of the units covered, together with the references on each unit, is handed to the students. At the second meeting, a discussion is started by the professor in charge, concerning the problems given in the first unit; the time allowed for these group conferences is not less than 30 minutes—of the 3-hour session—and not more than 60 minutes. The two or more remaining hours of the weekly meetings are devoted to the habits and characteristics of the organisms, or phenomena of the specific unit.

B. Each member of the class is told to select from a list of topics, some one problem upon which he is to prepare an original report, covering the history, factual material to date and personal remarks concerning the reading matter embodied in his report. The report is delivered orally before the class on definite dates assigned for that work. At such time, the class is privileged to question the student reporting, on the plan of seminar procedure.

C. The final practical examination is started four weeks before the last meeting of the class. Each student selects a topic which is of major interest to him; such as, the analysis of water, milk, sputum, disinfectant coefficient of commercial antiseptics, the change from normal to pathological blood, etc. A preliminary report consisting of a detailed outline of the method of procedure, materials to be used, preparations to be made and bibliography consulted, is handed to the head of the department for acceptance and permission to continue with the examination. Last year several parents coöperated with the department

to the extent of supplying their sons with material of questionable pathogenicity from their every-day medical practice.

Among the topics investigated by the 1930–1931 class were, agglutination tests on *B. abortus*, identification and bacterial count of washings from raw hides, blood count and morphology of the corpuscles of patients suffering from intestinal parasites, comparison of Board of Health sputum samples, bacterial count of well and spring water, etc.

From the foregoing brief outline of these courses, it can be readily seen that the work for the retail pharmacist consists largely of behavior and knowledge objectives. Experiments are in the nature of vicarious experiences in that they are mainly demonstrated, but nevertheless real.

On the other hand, the B.S. candidate, trained to become the diagnostic analyst with a cultural background, is able and ready to participate in the necessary skills and techniques of this specialized field.

COLUMBIA UNIVERSITY, COLLEGE OF PHARMACY.

WASHINGTON STATE ASSOCIATION DISCUSSES PRESCRIPTION PRACTICE.

L. D. Bracken, of Seattle, and Ronald P. Robertson, of Spokane, directed a prescription symposium; the subjects included:

Detailing Physicians.
1. Own Preparations.
2. U. S. P. and N. F. Preparations.
3. Pharmaceutical Specialties.
4. Proper Price for Prescriptions, Office Supplies, Pharmaceutical Service.

Delivery Methods and Costs.
How to Keep Adequate Store Records.
Credit to Physicians and Patients.
Stock Control.
Merchandising Stock for Prescription Stores:
1. Ethical Patents and Their Scope.
2. Toilet Lines.
3. Rubber Goods and Sundry Lines.
4. Window and Interior Displays:
   A. Professional.
   B. Merchandising.

U. S. P. and N. F. Display of Minn. Pharm. Assoc. at Minn. State Med. Assoc., 1932.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

All articles in these lists will be presented in abstract form in the bound volumes of the Year Book, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. W. cor. Lombard and Greene Sts., Baltimore, Maryland.

APPARATUS AND MANIPULATIONS.

Paget, Humphrey
Apparatus for continuous extraction with chloroform
J. Soc. Chem. Ind., 51 (1932), 190T

Thomann, J.
Observations on the testing of glass containers for medicines
Pharm. Acta Helv., 7 (1932), 75

PHARMACOPŒIAS AND FORMULARIES.

Schulze, Konrad
Review of the Belgian Pharmacopœia, 4th edition
Apoth.-Ztg., 47 (1932), 587, 615

PHARMACEUTICAL PREPARATIONS.

Brandrup, Wolfgang
Deterioration of wine of pepsin
Pharm. Ztg., 77 (1932), 519

Cralmeta, A.
Note on the unification of the formula for the preparation of Sydenham's laudanum
Bull. sci. pharmacol., 39 (1932), 278

Golse, J., and Hugot, J.
Precipitation of cherry laurel water by acids and salts of alkaloids
Bull. soc. pharm. Bordeaux, 70 (1932), 22

Golse, J., and Hugot, J.
Copper as a stabilizer of cherry laurel water
Bull. soc. pharm. Bordeaux, 70 (1932), 32

Guyot, René
Contribution to a study of the colored potions
Bull. soc. pharm. Bordeaux, 70 (1932), 41

Kroeber, Ludwig
Studies of a series of native fluidextracts
Pharm. Zentralh., 73 (1932), 321

Maingot, R.
Injections for hæmorrhoids
Med. Press (1932), 4851; through *Pharm. J.*, 128 (1932), 453.

Schousen, Chr.
Fluidextract of Rhamnus Purshiana
Dansk Tids. Farm., 6 (1932), 105

Schmatolla, O.
New preparations of aluminum acetate
Pharm. Ztg., 77 (1932), 484

Uges, J. Th.
Polysulphide content of Vleminckx's solution
Pharm. Weekbl., 69 (1932), 572

Zanotti, Vittorio
Indefinite fluidextracts of the Italian Pharmacopœia
Officina 4 (1931), 323; through *Chem. Abstr.*, 26 (1932), 3327

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS.

Barlow, O. W.
Effectiveness of phenobarbital as an antidote for strychnine poisoning in the rabbit
J. A. M. A., 98 (1932), 1980

Broom, W. A., *et al.*
Variation in susceptibility of different colonies of mice toward the toxic action of aconite.
Quart. J. Pharm. & Pharmacol., 5 (1932), 33

Cutler, Jessie T.
Influence of diet on carbon tetrachloride intoxication in dogs
J. Pharmacol. & Exper. Therap., 45 (1932), 209

Elphick, G. K., and Gunn, J. A.
Pharmacological actions of some alkyl derivatives of harmol
Quart. J. Pharm. & Pharmacol., 5 (1932), 37, 48, 56, 63

Epstein, D.
Actions of emetine and cephaeline on the circulation, uterus and intestines
Quart. J. Pharm. & Pharmacol., 5 (1932), 21

Gordon, H.
Overdose of ephedrine
Brit. Med. J. (1932), 3719

Hall, Edith M.
The chick heart method of biological assay
Am. J. Pharm., 104 (1932), 310

Harvey, F. T.
Mercurialism in cattle
Vet. Rec., 12 (1932), 328; through *Pharm. J.*, 128 (1932), 453

Leyton, O.
Report on dilaudid
Lancet, 16 (1932), 835

McCord, C. P.
Toxicity of allyl alcohol
J. A. M. A., 98 (1932), 2269

Moir, C.
Comparison of ergotoxine and ergotamine
Brit. Med. J. (1932), 3726.
Pabst, M. L., and Bliss, A. Richard, Jr.
Chemical and biological standardization of oleoresin of aspidium
Jour. A. Ph. A., 21 (1932), 431
Phillips, M. A.
Toxicity and chemical constitution of mercurochrome
Quart. J. Pharm. & Pharmacol., 5 (1932), 1
Phillips, F. A.
Toxic effects of phenolphthalein
Lancet 15, (1932), 803

BOTANY AND PHARMACOGNOSY.

Christensen, B. V., and Welch, Arnold D.
Relative size of ergot to potency
J. Pharmacol. & Exper. Therap., 45 (1932), 183
Dafert, Otto, and Siegmund, Otto
Fertilization experiments of stramonium and hyoscyamus
Heil- Gewürz-Pflanzen, 14 (1932), 98; through *Chem. Abstr.*, 26 (1932), 3069
Muszynski, Jan
Ash content of drugs
Wiadomosci Farmaceutyczne, 59 (1932), 147, 160; through *Chem. Abstr.*, 26 (1932), 3074
Peyer, W., and Gstirner, F.
Mate of commerce
Apoth.-Ztg., 47 (1932), 672
Schürhoff, P. N.
Detection of hemlock in anise
Arch. Pharm., 270 (1932), 145
Youngken, Heber W.
Pharmacognosy, chemistry and pharmacology of viburnum. III
Jour. A. Ph. A., 21 (1932), 444

BACTERIOLOGY.

Cruess, W. V.
Hydrogen-ion concentration in preservative action
Ind. & Eng. Chem., 24 (1932), 648

ALKALOIDS AND GLUCOSIDES.

Bertrand, Gabriel, and DeBerredo, P.
Existence and repartition of caffeine and theobromine in the organs of Paullinia Cupana
Bull. sci. pharmacol., 39 (1932), 273
Cooremans, A.
Note on emetine hydrochloride
J. pharm. Belg., 14 (1932), 389
Ekkert, Lad.
Contribution to the reactions of tropacocaine
Pharm. Zentralh., 73 (1932), 340
Hoffmann, W.
Bromometric determination of novocaine and anæsthesine according to Fijalkow
Apoth.-Ztg., 47 (1932), 686
Janot, M. M., and Faudemay, P.
Crystallized hordenine silicotungs-tote. Estimation of hordenine
Bull. sci. pharmacol., 39 (1932), 288
Maesemaeker, R., and Lucas, V.
New reagent for the detection of alkaloids and glucosides
Bol. assoc. brasil. pharm., 12 (1931), No. 8, 12; through *Chem. Abstr.*, 26 (1932), 3069
Munch, James C., *et al.*
Alkaloidal reagents. III. Propadrin, its homologs and derivatives
Jour. A. Ph. A., 21 (1932), 463

ESSENTIAL OILS.

Adams, Maxwell, and Kehoe, Lewis
Essential oil in desert plants. II
J. Am. Chem. Soc., 54 (1932), 2448
Bennett, A. H., and Tarbert, D. J.
Composition of machine-extracted lemon oil
Ann. chim. applicata, 22 (1932), 32; through *J. Soc. Chem. Ind.*, 51 (1932), 448
Mitchell, Lloyd C., and Alfend, Samuel
Estimation of volatile oil in cloves
J. A. O. A. C., 15 (1932), 293
Rosenthaler, L.
Detection of phosphoric acid esters (cresyl phosphate) in apiol
Pharm. Acta Helv., 7 (1932), 87
Zimmermann, J.
Critical survey of analytical methods for the assay of citronella oil
Perf. & Ess. Oil Rec., 23 (1932), 128

OILS, FATS AND WAXES.

Bourdiol, M.
Congelation of castor oil
Bull. sci. pharmacol., 39 (1932), 293
Dickhart, W. H.
Quince seed oil
Am. J. Pharm., 104 (1932), 335
François, Th.
Acidity of castor oil
Bull. sci. pharmacol., 39 (1932), 307
François, M. T.
Acidity of castor oil
Compt. rend., 194 (1932), 731; through *J. Soc. Ind.*, 51 (1932), 474
Glasgow, K. W. R.
Fixed oil from the nuts of Calophyllum inophyllum
J. Soc. Chem. Ind., 51 (1932), 172T

ANALYTICAL METHODS AND RESULTS.

Bordeianu, C. V.
Detection and estimation of zinc oxide in the presence of zinc sulphide
J. pharm. et chim., 15 (1932), 554.

Ekkert, Lad.
Contribution to the reactions of glycerol and mannite
Pharm. Zentralh., 73 (1932), 339

Ionesco-Matiu, Al, and Popesco, A.
Assay of veronal and mercury tannate
J. pharm. et chim., 15 (1932), 551

Jelley, E. E.
Colorimetric determination of small amounts of silver
J. Soc. Chem. Ind., 51 (1932), 191T

Klaassen, J. A.
Contribution to the detection of hydrocyanic acid in toxicological investigations
Pharm. Weekbl., 69 (1932), 655

Kuhn, A., and Seifert, R.
New Method for the determination of dry residue
Pharm. Ztg., 77 (1932), 547

Luckow, Curt
Accuracy of aræometric determination of alcohol
Pharm. Zentralh., 73 (1932), 323

Oakley, Margarethe, and Krantz, John C. Jr.
Note on the assay of tincture of ferric chloride
Jour. A. Ph. A., 21 (1932), 468

Risch, C.
Evaluation of tincture of valerian by diaphanometry
Pharm. Ztg., 77 (1932), 616

Rosenthaler, L.
Brom-acidimetric titrations
Pharm. Acta Helv., 7 (1932), 88

Sanchez, Juan A.
New test for primary cyclic amines and its application to the testing of drugs
Ann. chim. anal. chim. appl., 4 (1932), 132; through *Chem. Abstr.*, 26 (1932), 3070

Schaller, N. C., and Baldinger, L. H.
Note on the assay of hyoscyamus
Jour. A. Ph. A., 21 (1932), 442

von Bari, Sigmund
Evaluation of potassium acetate and ammonium acetate solutions
Arch. Pharm., 270 (1932), 201

von Miko, Julius
Identification of sodium salicylate, sodium bicarbonate, ipecac, sugar, atropine, hyoscyamine and morphine in the presence of one another
Pharm. Acta Helv., 7 (1932), 91

Wael, Helga
Estimation of small quantities of lead in bismuth subsalicylate
Dansk Tids. Farm., 6 (1932), 116

Will, Hanns
Bornträger reaction for emodin in senna
Apoth.-Ztg., 47 (1932), 660

Winkler, L. W.
Determination of potassium and sodium iodides
Pharm. Zentralh., 73 (1932), 324

Zippel, F.
Estimation of cod liver oil in emulsions and tests for fat-soluble vitamine
Pharm. Ztg., 77 (1932), 535

ORGANIC CHEMICALS.

Booth, Harold S., and Bixby, E. May
Fluorine derivatives of chloroform
Ind. Eng. Chem., 24 (1932), 637

Denigès, G.
Microchemistry of derivatives of cinchonic acid
Mikrochem., 10 (1932), 430; through *J. Soc. Chem. Ind.*, 51 (1932), 448

Laporte, L.
Study of the hydration of glycerol by the measure of its viscosity
Bull. sci. pharmacol., 39 (1932), 284

Smelt, E. M.
Solubility of chlorbutol
Pharm. J., 128 (1932), 493

Udall, P. J.
Recognition of the flavines
Analyst (May 1932); through *Pharm. J.*, 128 (1932), 434

Wagenaar, M.
Microchemistry reactions of furfurols
Pharm. Weekbl., 69 (1932), 449

Wagenaar, M.
Microchemical reactions of saccharin
Pharm. Weekbl., 69 (1932), 614

TOKYO ESPERANTISTS.

Esperantists in Tokyo interested in pharmaceutical affairs held their tenth friendly gathering on April 20th at the Shiseido Hall, on the Ginza. Mr. Eigo Koyama, Prof. Kozo Uyeda, of the Nagasaki Medical College, and Secretary Koji Okamoto, of the Japan Esperanto Society, delivered addresses.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor will also undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

ADVERTISING AND SELLING PROBLEMS OF DRUG STORES.

COURTESY, TACT, PATIENCE AND SELF-CONTROL—FOUR ESSENTIAL ATTRIBUTES IN SUCCESSFUL DRUG STORE SALESMANSHIP.

BY PAUL C. OLSEN.

Half a dozen bottles of an aperient water to be delivered at once a half mile away is not the simplest order in the world to fill from a drug store. This is particularly true if immediate delivery is demanded and, especially so, when the demand comes from one of those pompous matrons who wants what she wants when she wants it—or, at least, thinks she does. It is useless to try to tell her that the delivery boy has just left for the wholesale house and won't be back for three-quarters of an hour and that you are alone in the store. It is hopeless, also, to try to make her understand that a half dozen bottles of Perrier water bulk considerably larger than the usual drug store delivery.

These are the conditions under which a drug store salesman has opportunity, if he will, for the exercise of four very important virtues which are characteristic of successful drug store salesmen. Real ability is required to be courteous and pleasant to a woman who states her wants in a tone she might use in talking to the garbage man. Not only is courtesy required, but also a degree of self-control comparable to that of the biblical Job.

The most natural thing to do is to give such a person a red-hot retort in kind. A druggist is not in business, however, to engage in sarcastic conversational exchanges with his customers. His business is to supply the merchandise his customers want in a way that will impress them so favorably that they will want to visit the store again.

Any drug store salesman who has had any experience at all can tell stories of shabbily dressed people who visit drug stores regularly and buy surprisingly large quantities of merchandise. It is a mistake for a salesman to think that he can tell by looking at him how much money a person has in his pocket.

I have seen a drug store salesman leave, without apology, a woman dressed in the style of 1907, who was on the point of buying several dollars worth of supplies for her first-aid cabinet, and rush over to a gaudily attired young woman who then spent fifteen minutes fingering the entire stock of lipsticks, trying to decide whether to buy a 25 or a 35-cent one. Meanwhile, the woman in the out-of-date clothes had left the store.

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Regardless of their manners (or lack of them) or appearance, a drug store salesman should treat the people who visit the store in the same courteous attentive way in which he meets the people who are his best friends. Peculiarities of manner and dress are not matters which really concern him. His job is to give people what they need and want, as far as it is possible for him to do so.

There is no use denying, however, that courtesy and three virtues closely related to it—tact, patience and self-control—are most difficult to practice under some of the provocations which a druggist has to endure.

Courtesy is something more than having a smile on one's face. Real courtesy requires a sincere consideration of the wishes, needs and desires of others. This does not mean that a drug store salesman must assume an air of subservience and undue humiliation, but it does mean that every customer should receive polite and interested attention.

Many times customers will say and do things which, to a person experienced in a drug store, are ridiculously absurd and hilariously funny.

Nobody likes to be corrected for their mistakes and a druggist is the last person in the world who should criticize customers' spelling and pronunciation. A courteous salesman never willingly embarrasses or humiliates a customer.

As mentioned in the preceding article in this series many articles sold in a drug store require little or no selling effort. When a woman comes in to buy a 25-cent bottle of tincture of iodine, no sales talk need be delivered to interest her in its purchase. She already has made up her mind. But what she does demand and appreciate is prompt, polite and interested service.

A tactful person is one who gets along with other people because he is considerate of other people's feelings. He does nothing and says nothing which would give offense or cause embarrassment. Tact is shown by the salesman who greets the prospective buyer of hair dye without a meaningful glance at her ink-black tresses. A tactful salesman never shows, by word or facial expression, any surprise at a portly matron's sudden and repeated purchases of "reducing" salts.

Patience is the ability to endure calmly and placidly things which may not be altogether pleasant and enjoyable. Anybody who works around a drug store knows how important patience is. When fifty powder papers are carefully arranged on the prescription counter and just ready to be folded and then somebody opens the back door and lets in a terrific gust of wind, that's a situation in which patience is indeed difficult to exercise. Nothing is gained, however, and much is lost by letting the unfortunate occasion be the cause of an out-burst of angry words.

There are tiresome customers who insist on telling, in the minutest detail, every incident in their uninteresting lives. There are venerable medical practitioners who endlessly retell jokes which were current in their college days. These doctors would be deeply grieved and offended if their jokes each time told to the long suffering drug store salespeople did not produce at least a good semblance of uproarious laughter. Then there are dull and stupid customers who never seem to learn, for instance, how to fill a fountain pen or to put a film in a camera.

The rewards of patience under these trying conditions are profitable sales. Patience does not mean that a drug store salesman must constantly humble and humiliate himself, nor does it mean he must spend endless minutes listening to idle gossip while the telephone rings and prescriptions are waiting to be com-

pounded. That's when the related characteristics of tact and courtesy are especially important. The skilful salesman deftly switches the conversation in a way which leaves the talkative person pleased and satisfied and the salesman free to do his work.

OUR BEST CUSTOMER—BABY.*

BY SAMUEL KRONE

Isn't it true? It would indeed surprise you to check the amount of money invested in baby merchandise.

Even in depression and unemployment, when every necessity is considered a luxury, baby's needs come first. He is the druggist's most consistent and exacting patron.

What are we doing to make this business one of our features and specialties? Except for an occasional display in a window, a table or so, a few leading items at cut prices, the baby goods are spread out all over the store. The rubber sundries one place, foods in another, bottles somewhere else and specialty items in the rear.

The modern mother demands the best for her baby. She has her doctor but cannot go to him every day and for each little thing. There can be some one there—the neighborhood druggist.

Why not be a headquarters for the baby? The mother must go somewhere for her needs and it may as well be you.

Secure pamphlets from the Labor Department, state and local health authorities on the care of the infant from birth up to three years of age.

Become familiar with all the needs, symptoms, and in every way each step of the baby's growth. Teach your clerk to speak intelligently on this subject. Secure additional information from your favorite physician. Give this advice freely and with authority, and let the people know about it.

Reserve a complete section of your store exclusively for baby merchandise. Add many items not usually carried, such as bibs, layettes and summer suits and scales.

Have everything marked plainly and be ready to answer questions on any of the merchandise offered.

Keep your stock fresh, return all old foods for exchange, and complete the atmosphere with pictures of prize babies.

Once a year have three or four drug stores run a baby show for the neighborhood. With each dollar of baby goods purchased a free entry is given. Have your known local baby specialist take charge. It means added publicity and the cost will be reasonable. The writer will gladly demonstrate the success of this plan.

Issue prizes and print the photos of the winning infants in the local paper. Have photographs of leading contestants in your window.

Department and furniture houses do these things successfully; why not the druggist? He is certainly entitled to the business, if he will only go after it.

"A baby drug store" will mean more professional respect, added confidence and a business that cut prices cannot even touch. It is a good business. The

* Section on Commercial Interests, A. PH. A., Miami meeting, 1931.

druggist needs it. A little coöperation or else he can do it alone. The writer can go into further details with those who are interested. Eventually a good baby business means a good prescription business. A good prescription business is the foundation of a good living and professional attainment for the proprietor-pharmacist. It means a real service to his community. Let others cut prices and worry about sundries and consignments.

Become "a baby druggist." It pays.

CONSERVATION OF DRUG STORE ASSETS.*

One plan to render assistance to a merchant in conserving the capital in his business is to provide for his consideration the methods and practices utilized by successful merchants. Quite a different plan is to set forth the inefficient methods used by unsuccessful merchants. A knowledge of the wrong way to operate a business is perhaps just as important as knowing the right way. A few, of course, fail because of conditions over which they have no control. In general, however, it may be said that most business failures lack the necessary knowledge to make a success and when analyzed disclose the incompetent manner in which they functioned.

The experiences of a failed druggist can be turned to profit only when the causes thereof have been investigated, and the results applied. As soon as a merchant fails a new man with new capital seems always available to step in and try his fortune. In the past no lesson has been drawn from the accumulated experiences of the vast number of failures that have taken place, because in the majority of cases, the system of elimination has been such as to preclude outsiders from learning the causes of failure. In the report just released by the Bureau of Foreign and Domestic Commerce on "Causes of Failure among Drug Stores," one of the purposes has been to set forth the experiences of the druggists who failed. Prevention of failure to some extent, another objective of the study, can come through a system of general education through dissemination of the experiences of others in reports in the press and schools.

Another purpose of this record of business failures is to indicate the deadly effects of administering to a weak and poorly managed business an overdose of credit. Factual data in the report indicates that the liberality of some creditors was a primary cause of failure, for the majority of these druggists should never have been encouraged to enter business.

There are undoubtedly many individuals engaged in business to-day who are not fitted by training, experience or ability to manage a business successfully. Unfortunately, it is not generally recognized how difficult it is to make a success of a retail store to-day. Many a business venturer, it would seem, little realizes or appreciates the necessary requisites for success. With only an optimistic expectation of profits, many enter business through the assistance of credulous and liberal creditors. These venturers apparently have an utter disregard of the risk of failure, difficulties to be encountered, and the capital required. In other words, they lack

* An address by Victor Sadd, in Charge of Business Failures Studies, Department of Commerce, before The Drug Store Survey Conference, St. Louis, Missouri, April 26, 1932.

the necessary training, ability and experience. The experiences of retail druggists discussed in the report show the outcome of those who entered business under such handicaps that they were doomed to failure from the beginning. There are no restrictions governing the entrance of anyone into business who observes the law. Consequently, incompetence and lack of capital are generally given as causes of failure.

The studies made by the Department of Commerce go into the details of causes of failure more thoroughly than the usual analysis. In the survey on "Causes of Failure among Drug Stores," we took the names of all those who had operated drug stores and had failed for a period of five years and studied only those that could be interviewed. Out of 50 or 60 stores we were able to make complete studies of 30. One of the outstanding causes among the failed group was their overhead costs which were about 10 per cent greater than the same costs for a group of 40 active drug stores in the same city. Bad debt losses among the failed stores which were doing a credit business, expressed as percentage of total sales were twelve times larger than for drug stores reporting in the National Retail Credit Survey of 1927.

A cause of failure in some instances and of impending failure in others is often revealed in the location the store occupies. There are, of course, many factors to be considered in determining the appropriate location of a store, but in many cases of business failure, it is evident that the most fundamental and most important considerations are apparently overlooked or disregarded by both debtor and creditor. Through analysis of the locations of the stores studied, it was found that $1/3$ of them had chosen sites where drug stores had previously failed. On the basis of the data secured in this survey, it seems evident that several factors affecting store location were ignored. In no single instance did it appear that the number of potential customers to be served by the retail outlet had been determined. It had been estimated by some students of successful drug store operations, that a drug store of average size must serve, at least, 500 families, or 2500 persons, before a reasonable profit can be expected. The amount and stability of the customers' incomes should also be taken into consideration. Some commercial failures are due to the results of unusual fluctuations in customers' incomes.

On an average the proprietors of the failed stores experienced difficulty in paying their bills for $14\frac{1}{2}$ months prior to failure. Some of these were never solvent, but experienced no difficulty in securing considerable credit. The history of store No. 18 is interesting. The druggist in this case had been a drug store clerk for approximately 30 years. Investigations of his business history revealed that he had practically three failures in all. At one time his equity in his first store amounted to over $10,000 but neglect of business caused his downfall and he was forced to liquidate his debts by selling the store. A second smaller store was opened in another location. High personal expenses which were not curbed and a small volume of sales, due to a poor location, soon caused his failure. In his third unsuccessful attempt he bought the stock and fixtures of a bankrupt business and endeavored to succeed at the same location where two others had failed previously. This particular individual is now a clerk in a chain drug store but stated he was going to purchase another drug store soon. One creditor gives the opinion that he is a good clerk but has no ability as a proprietor. Another mentioned "inadequate

management." He apparently was continually in difficulties but able to get credit enough to start again whenever he so desired. The foregoing discloses the fact that the antecedent data of an applicant for credit should be scrutinized more carefully than they appear to have been. Here is another instance that brings out the importance of previous details in credit extension.

The druggist concerned in this case stated that he had owned five stores in less than ten years and that he had never been able to make a profit. He gave as the reasons for his last failure high rent and poor location. One creditor gave the reason that "potential customers disliked him personally." Another gave "indifferent management and poor stockkeeping" as the causes of failure. Another mentioned "inefficiency and lack of capital." At the present time he is manager of a chain drug store. He stated that he soon expected to make his seventh attempt to operate his own store.

In only 2 of the 30 concerns scrutinized was there an attempt made to keep adequate records. Here is a brief history of one of the failed druggists: This man graduated from a foreign university, came to this country several years ago, taught foreign language classes in various cities for four years, and then decided to go into the drug business. He completed two years in a college of pharmacy and with $1700 borrowed from friends and relatives, bought stock and fixtures of a bankrupt drug store. He operated for a year and decided his success was assured. No books were kept and the true condition of affairs was not known until failure. He bought two large apartment houses and an expensive automobile on credit. Starting in business with no funds of his own, he owed at date of failure, approximately $25,000 which accumulated in three years. Some of the principal creditors believed him not only dishonest but also lacking in business ability.

The results of this study indicate clearly that creditors should consider the absence of an adequate set of books on the part of the merchant a pronounced danger signal. Another illustration of the disastrous effects of not keeping books is the case of a middle-aged man, formerly a train dispatcher, who completed two years in a college of pharmacy, and became a registered pharmacist. With $600 of his own funds, plus $5000 provided by friends and relatives, he bought a going drug store, and started business, with no previous experience. The accounting system, consisting of a notebook ledger, did not reveal the true state of affairs at any time. An analysis of the conditions, at date of failure, revealed the fact that overhead expenses amounted to approximately 75 per cent of net sales. Store location was exceptionally poor, accordnig to opinions of both druggist and creditors. Principal creditors stated that this druggist had no business ability, and not sufficient working capital. At present he is a clerk in a small drug store.

The owner of store No. 16 stated that a wholesaler induced him to buy. He paid $325 down on the original purchase price of $2000. The store had originally been turned back to the wholesaler by a previous owner who failed. His contract called for monthly installments of $100 to the wholesaler on the balance of the original purchase price. The gross sales of the store never exceeded $600 per month. Approximately $400 was needed to meet overhead expenses and payments on the balance owed for the store. This would leave him only $200 a month to use for merchandise purchases. For this merchant to have remained in business he would have had to sell $200 worth of merchandise for $600. Such a mark-up was, of

course, not possible and he failed in less than six months. The fact that the business lasted six months, under these circumstances, typifies the practice of numerous creditors extending credit to incapable persons without a thorough investigation.

The average rent paid by the failed merchants was 10.6% of net sales; whereas 40 active drug stores in the same city were paying only 4.7% of net sales for rent. Major operating expenses running higher than the average expenses of profitable merchants should be regarded as indications of a probable failure. The amount of present or expected sales should be considered in relationship to the rent paid. The average profit of the successful drug stores, just referred to, was 3.8% of net sales. Thus, the average profit made by them was less than the difference between the rents paid by those who failed, and those who are still active, which amounts to 5.9% of net sales. High rental costs is one of the failure signals to be noted and heeded by both the merchant and his creditors. Salaries, another major expense item, must be proportionate to sales so as to insure profitable operation. Unreasonable withdrawal from the income of a business, in the form of salaries, is significant of imminent danger. All other overhead expenses, if not in proportion to the volume of business done, is also convincing evidence of inefficient management, and unprofitable operation. The merchant and his creditors will find it advantageous to determine the exact cost of doing business and, after a comparison, item by item, with the average costs in competitive and similar stores, can thereby determine the possibilities of success.

Sixteen creditors accused five different druggists of dishonesty. There were several unethical practices which were called to the attention of the examiner, but, apparently, no action was brought by their creditors. One form of dishonesty mentioned was the indorsing of notes to loan and finance companies by three of the failed group, who, in coöperation with each other, managed to secure large amounts of capital. One of them owed 7 different loan and finance companies, as well as 33 wholesalers and jobbers. Another owed 6 loan and finance companies and 44 wholesalers and jobbers. The third owed 4 different loan and finance companies and 66 wholesalers and jobbers. The creditors in all three cases claimed there was collusion among them.

There are numerous forms of dishonesty whereby unscrupulous merchants defraud their creditors. One case concerned a druggist who had signed a long lease, and later ascertaining that the business was being operated at a loss, sold it to an employee on time payments. The employee soon filed a petition in bankruptcy. Creditors claimed that merchandise disappeared in considerable quantities before the receiver was appointed. The bankrupt stated that he was looking for a new location. He also intimated that he had sufficient capital to start a new business.

In another case, one creditor stated the failed druggist "schemed to get the best of his creditors whenever possible; and was also untruthful and dishonest." A second creditor submitted an opinion on the same case as follows: "Mismanagement, careless investing of money in real estate." Creditors in general claim that this merchant indulged in certain unethical practices to secure real estate. A form of dishonesty disclosed by the investigator, and one that is no doubt prevalent in all lines of retail trade, is that of a salesman familiar with the trade handling, as a sideline, merchandise of a store just prior to failure and selling it to other retailers, thereby defrauding creditors.

The business experiences of most of the druggists studied provide examples of an unjustifiable entrance into business. One merchant who was considered an inefficient drug clerk started in the drug business with no capital of his own and over $6000 in debt, but was able to secure in one year an additional $4485 credit from wholesalers. His original capital was borrowed at such prohibitive rates of interest that profitable operation was impossible.

The owner of another failed drug store had been a mechanical engineer prior to his initial venture, with a partner, in business. During the first two years in business the store operated at a loss and the former mechanical engineer decided to buy out his partner's interest and in addition to giving him a note for $7000 (value placed by partner on his equity) assumed all outstanding liabilities, which amounted to approximately $5000. The business was not, according to creditors, even worth $3000. The store fixtures were old and stock run down. The store was unfavorably located at the end of a street blocked by car tracks and a high fence. Practically all automobile and pedestrian traffic was diverted to the next through street. For seven years this druggist went deeper and deeper in debt. He kept no records, and made poor guesses as to the value of his business and the direction it was tending. This individual was never able to discount a bill during the seven years he was in business and his debts instead of being reduced, increased year by year. He was, notwithstanding, able to secure sufficient credit to stay in business seven years. Had not one creditor been accidentally informed of the note given to his partner five years previously for $7000 this man would probably still be in business.

Insufficient capital is frequently given as a cause of failure. When analyzed it is often found that the merchant had more capital in his business, put in by incurious creditors, than the prospects of the business justified, and more than the owner had ability to administer.

While inadequate capital in some cases may have been a contributing or primary cause, nevertheless a more important cause in most cases was financing under adverse conditions. Although sufficient capital was readily obtainable from various sources, yet it was only at such high rates as to render profitable operation impossible. When capital is obtained at rates of interest that are greater than the average profits in that particular line of trade, the result is unprofitable operation and probable failure. The significance of this statement is emphasized in the case of one merchant who paid 36% interest on the $7250 he borrowed to start in business.

Statements of creditors to the effect that their debtors failed because of insufficient capital, incompetence or lack of business integrity are frank admissions of errors in judgment and mistakes made in credit extension. Proper investigations of the debtors prior to the granting of credit would have revealed at least some of the defects evidenced after failure.

The majority of creditors reporting on the causes of failure of store No. 26 stated that chain store competition forced the owner into bankruptcy. None of the creditors reporting accused the owner of incompetency but stated that he was unable to meet the competition of a very modern, well-equipped chain drug store, selling at lower prices. The new chain store was located directly across the street and on a more desirable corner. The debtor stated that he lacked the necessary

knowledge of merchandising and business principles to effectively meet chain store competition, but as a consequence of his failure in the drug business he realized the value of an understanding and application of business fundamentals which he studied. This former druggist is now in a different line of business as a half owner of a small but successful chain store organization and by continuous study is acquiring a knowledge of profitable business methods which are being applied effectively. This is an illustration of a man who profited from his failure.

Authorities agree that it is not so much our credit system that is at fault, as the uses to which it is applied at times. When properly utilized, the advantages of credit are indispensable to our present system of business, but when abused, it not only injures the grantor, but also the debtor and consumer.

As business emerges from the trough of the present depression, experience will remain not only as a net gain, but also as one of the most valuable assets. Those in the drug business and those who contemplate entering the retail drug business, can profit by the mistakes of others if full utilization is made of the knowledge ascertained from these failures. This can be achieved by preventing the unfitted from entering business, and assisting the efficiency of those in business, in such a way as to fortify against future failures and effectively conserve the capital invested in the drug store business.

THE PHARMACIST IN THE FEDERAL CIVIL SERVICE.*

BY PAUL J. THOMAS.[1]

From the time of the ancient apothecary with his mysterious concoctions to the present-day pharmacist, with his scientific training and effective drugs, the medicine man has been highly regarded by his fellows.

Pharmacy is a profession (1) because of the special college training that is required, which is now three years in length and which will be four years after 1932; (2) because of the license that is required in all states before one can practice pharmacy, and which is difficult to obtain as shown by the failure of two-thirds of the applicants in the recent state examinations in Ohio and Wisconsin; (3) because the practice of pharmacy is fully regulated by state law; (4) because the manufacture and dispensing of medicines is a responsible work, for there are many poisons used, and the quality of the drugs must be tested and assured; and (5) because there is a national organization, the AMERICAN PHARMACEUTICAL ASSOCIATION, with state and county branches, which is working all the time to advance the usefulness of pharmacy to the public.

The pharmacist in a hospital or dispensary has the duty of ordering all the drugs and manufacturing all the medicinal preparations used and of dispensing them on the doctors' prescriptions. This includes the handling of liquors and narcotics. In addition he orders and distributes the many so-called drug sundries, such as rubber goods. He must not only give his expert advice to the doctors in regard to the ordering and use of medicines, but must also check the accuracy of the prescriptions that he fills, so as to prevent any mistake and the harming of a patient.

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* Section on Education and Legislation, A. PH. A., Miami meeting, 1932.

[1] National Home Hospital, Annex, Dayton, Ohio.

Now how does the federal civil service regard the pharmacist? At present, there are two grades for registered pharmacists, and none for registered assistant pharmacists. The so-called pharmacists' assistant in the civil service is placed in SP 4th grade at $1620 to $1980, and the pharmacist in P & S 1 at $2000 to $2600, according to length of federal service, personal rating and size of the hospital. They both have the same requirements, namely, the completion of a two-year college course in pharmacy and a state license as registered pharmacist.

X-ray, clinical laboratory and dental technicians, with no college training or state license required, start in the same grade as the assistant pharmacist, SP 4; and nurses, dietitians and physiotherapy and occupational therapy aides can be advanced into the grades of SP 7 and 8, which are higher than P & S 1, which is the same in pay as SP 6, and which is the highest the pharmacist can go. Doctors of medicine and dentistry average about $4000 with a maximum of $6500 for a hospital superintendent.

The Veterans' Administration with its sixty odd hospitals is the greatest example of unified practice of medicine in this nation, and it presents an unparalleled opportunity for advancement of the science of medicine by research clinics and the practice of uniformity in treatment and medication.

In this project the pharmacists will have their share, and will be ready and capable of giving material assistance in furnishing the best possible medicines to the ex-service men. I should like to see more uniformity in the drugs and medicinal preparations that are made available in the different federal hospitals, so that the doctors and patients will not find the treatment so different in changing from one place to another. Only the best medicines for the different diseases should be used, and helping to attain this is one of the functions of the pharmacist.

ARE BEGINNING PHARMACY STUDENTS UP TO STANDARD?*

H. G. DEKAY AND C. B. JORDAN.

With the opening of the academic year of 1926–1927, Purdue University inaugurated an orientation period, whereby it was hoped that each student would be enabled to make a better start with his university work and to adjust himself more effectively to the new conditions of university life. At the inauguration of this testing period there were seven schools in the University and since that time the number has grown to 10 schools.

The orientation tests have been conducted under the supervision of the director of Educational Reference. The results are carefully analyzed and the findings with comparisons are sent each year to the faculties of the different schools on the campus.

These findings, as they pertain to Pharmacy students, have been carefully weighed and comparisons have been made over this five-year period for the purpose of giving our faculty an insight into the type and training of the student with whom they have to work and also to present the needs of the student so that his work can be adjusted to his ability.

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* Section on Education and Legislation, A. PH. A., Miami meeting, 1931.

The purpose of this paper is to set forth: *first*, the uses that we are making of the orientation tests; *second*, the value of the orientation tests in predicting the ability of students; *third*, the type of students entering Pharmacy.

During the orientation period for the freshmen the following tests are administered:

1. The National Council on Education Psychological Examination;
2. The Iowa Placement Chemistry Aptitude Test;
3. The Iowa Placement Mathematics Training Test;
4. The Purdue Placement Test in English.

The scoring on the various tests is not a percentile rating but an average score made on all the tests given at orientation. The highest scores that can be obtained on the tests are as follows: Psychology 319, Chemistry Aptitude 109, Mathematics Training 71 and Purdue English 239. The tabulations that we are using are the total averages of all tests given to all students entering the various schools of the University.

These tests have been used in sectioning students in chemistry, English and mathematics. Also any student obtaining a low rating on the English tests is required to take a subcollegiate English course as a prerequisite for freshman English. The same is true in mathematics. Students obtaining high ratings on the English and mathematics tests are given special consideration in these courses.

Table I (for the first year of the tests 1926–1927) shows that Pharmacy students ranked the lowest of the seven schools in Chemistry and Mathematics, above Agriculture in Psychology and above Agriculture, Mechanical Engineers and Science in English. This meant that the students of Pharmacy were more poorly trained in the fundamentals and that the mortality should be high in this one school. One explanation for this status is that the pharmacy course was a three-year course while all other schools gave nothing but the four-year course, therefore those students with poorer training turned to the school where they could graduate in three years.

TABLE I.—1926–1927.

	Agri.	Ch.E.	C.E.	E.E.	M.E.	Home Ec.	P.E.	Pharm.	Sci.	I.E.	Pharmacy Rank.
	−	+	+	+	+						
Psychol.	126.	182.50	159.41	156.11	148.96	....	....	128.89	142.22	....	6th of 7
	+	+	+	+	+				+		
Chem. Apt.	54.59	76.53	65.52	68.47	65.19	....	....	53.80	58.15	....	7th of 7
	+	+	+	+	+				+		
Math.	19.60	30.64	27.15	25.83	25.36	....	....	19.33	21.74	....	7th of 7
	−	+	+	+	−				−		
Engl.	64.91	93.17	79.29	80.28	73.39	....	....	76.11	75.48	....	4th of 7

TABLE II.—1927–1928.

	+	+	+	+	+	−			+		
Psychol.	119.88	146.72	135.60	134.30	131.06	111.82	....	114.98	127.42	....	7th of 8
	−	+	+	+	+	−			+		
Chem. Apt.	35.93	60.96	48.24	50.05	49.20	32.94	....	42.90	43.08	....	6th of 8
	−	+	+	+	+				+		
Math.	22.69	40.46	35.53	36.15	34.20	....	....	24.02	25.57	....	6th of 7
	−	+	+	+	+	+			+		
Engl.	75.97	107.57	100.89	96.60	96.92	100.16	....	88.10	101.93	....	7th of 8

TABLE III.—1928–1929.

	−	+	+	+	+	+			+		
Psychol.	117.80	162.90	141.76	147.14	144.98	120.30	....	119.18	146.56	....	7th of 8

	Agri.	Ch.E.	C.E.	E.E.	M.E.	Home Ec.	P.E.	Pharm.	Sci.	I.E.	Pharmacy Rank.
	−	+	+	+	+	−			+		
Chem. Apt.	42.90	65.40	54.30	58.78	56.00	41.48	....	44.50	52.51	....	6th of 8
	+	+	+	+	+				+		
Math.	23.89	37.58	33.29	34.96	32.98	....	....	20.66	27.49	....	7th of 7
	−	+	+	+	+	+			+		
Engl.	81.70	111.20	93.16	96.59	93.15	104.29	....	83.39	106.80	....	7th of 8

TABLE IV.—1929–1930.

	−	+	+	+	+	+	−		+	−	
Psychol.	99.92	151.06	129.38	130.56	132.60	111.50	89.92	109.68	132.10	106.16	7th of 10
	+	+	+	+	+	−	−		+	−	
Chem. Apt.	42.68	62.45	52.41	60.34	59.76	41.06	39.61	46.21	54.41	46.17	7th of 10
	+	+	+	+	+		−		+	+	
Math.	25.61	38.78	35.48	36.52	35.73	....	22.57	23.73	28.96	27.00	8th of 9
	−	+	+	+	+	+	−		+	−	
Engl.	89.19	133.72	114.95	114.43	116.91	120.50	88.28	101.36	134.32	77.17	7th of 10

TABLE V.—1930–1931.

	−	+	+	+	+	−	−		+	−	
Psychol.	115.30	180.90	154.90	158.30	156.70	136.70	109.50	147.70	153.70	126.00	6th of 10
	−	+	+	+	+	−	−		−	−	
Chem. Apt.	46.70	71.10	60.50	63.80	60.60	45.70	41.50	55.10	53.40	49.50	5th of 10
	−	+	+	+	+		−		−	−	
Math.	22.75	40.06	35.53	37.63	35.53	....	21.61	28.87	28.30	27.49	5th of 9
	−	+	−	−	−	+	−		+	−	
Engl.	83.50	122.00	106.80	108.60	105.70	118.70	83.00	109.70	118.60	84.50	4th of 10

TABLE VI.—RANK ON THE UNIVERSITY HONOR ROLL, 1926–1931.

	26	27	27	28	28	29	29	30	30	31
1926–1930	8	8	8–9	7	9	7	9–10	8–9–10	..	..
1927–1931	..	..	1	6	6	8	8	7	8–9–10	..
1928–1932	..	..	..	..	4	2	1	3	1	..
1929–1933	..	..	..	..	..	..	7	8	4	..
1930–1934	..	..	..	..	..	..	..	..	3	..

The following is taken from "Studies in Higher Education VIII" by J. N. Stalnaker (1928), "The Electrical Engineering students (at Purdue) rank second in most tests and the Civil Engineering students third. The actual difference of means, however, is not significant. The Pharmacy students also frequently displace Agriculture in last place. Here again the differences are not significant."

Table II (1927–1928) shows that the entering group of Pharmacy freshmen is still near the bottom. They ranked next to or above Agriculture and Home Economics. This was the first year for the School of Home Economics and the second year of the orientation tests.

Table III (1928–1929) is also like the first and second tables, as the same conditions seem to prevail as in the preceding years. This condition may be due, in part, to the three-year course in Pharmacy because very few of those students entering Pharmacy chose the longer four-year course.

In 1929–1930 (Table IV) two new schools have been added to the University, the School of Physical Education and the School of Industrial Education. The rank of the students entering Pharmacy this year was again next to or above Agriculture, Home Economics and these new schools.

However, in 1930–1931 all Pharmacy schools of Indiana required the four-year course as a minimum for entering students. This placed the Pharmacy students on a par with all students entering the University. The question was asked, "What effect would this have upon the type and rank of students entering Pharmacy?" The results of the orientation tests as shown in Table V clearly indicate the answer

to this question. In every case the Pharmacy students ranked not just above Agriculture as in the past four years but in Psychology they ranked above Agriculture, Home Economics, Industrial Education and Physical Education, or 6th out of the 10 schools; in Chemistry they ranked 5th of the 10 schools, that is, above Agriculture, Home Economics, Industrial Education, Physical Education and Science; in Mathematics the rank was about the same as in previous years; in English they ranked fourth in the University, above Civil Engineering, Mechanical Engineering, Home Economics, Agriculture, Physical Education and Industrial Education.

The following statement is taken from the analyzed report sent to the faculty by the director of Educational Research on November 6, 1930: "There are two items particularly worth noting: the improved quality of the Pharmacy students as compared with previous years, and the fact that the Mathematics Training Test, administered this year for the first time to Science women, shows them to be appreciably superior to Science men."

If the orientation test is an indication of the ability of the student, as the first four years have seemed to indicate, then this can mean two things for Pharmacy students at Purdue: first, the mortality of the present class of freshmen will be far less than that of any previous year; second, the achievement of this group of students should be superior to any previous group. The outcome of the college career of these students is being watched with a great deal of interest and, after the completion of the first year of their course, the results so far obtained seem to bear out the predictions set forth above.

The mortality seems to be predicted by the orientation tests because the greater percentage of those students whose rating lies in the lowest one-tenth on orientation fail to complete the course due to their inability to satisfactorily carry the required load prescribed by the University.

From Rules and Regulations Governing Students, Purdue University, comes the following:

"A student who, at the end of any semester fails to make a passing grade in a minimum of 12 hours of the work for which he is registered in that semester (or in a minimum of 6 hours in a summer session of 9 weeks) shall be placed upon probation for the next two sessions (whether semester or summer session), for which he is registered; and in case in either of the next two sessions for which he is registered he fails to pass the required minimum number of hours (12 hours for a semester, 6 hours for a summer session) he shall be dropped from the University; provided that when failure to make a passing grade in 12 hours work for which he is registered (6 hours in a summer session of 9 weeks) is due to the temporary record of I, this rule shall not apply. No student, however, will be dropped for failure in one subject only."

Beginning in September 1931, all students who fall in the lowest one-tenth of the orientation group shall automatically be placed upon probation, the results of the orientation tests in the past being used as a basis for this action. In this way those students in the lower group will be permitted to remain in the University if they are capable of carrying the work assigned to them but they must demonstrate their ability to do so during the first semester.

Purdue University not only penalizes poor scholarship but it also rewards good scholarship. Quoting from the general catalog of the University:

"High scholastic attainment is recognized by citation for distinguished scholarship. Those placed on the list of distinguished students are entitled to special privileges as follows:

"Junior and senior students cited for distinction in scholarship are relieved from the University requirements regarding regular attendance at class exercises during the semester immediately following a citation for scholastic distinction, but such absence is allowable only after satisfactory arrangement between the student and instructor.

"Honor students of all classes are offered the opportunity to do, for credit toward graduation, work in addition to their regular schedule of studies. These additional assignments must have the approval of the head of the School involved.

"By authorization of the Board of Trustees any student qualifying as a distinguished student is exempted from the payment of the required incidental, library and laboratory fees for the semester or term of attendance immediately following such qualification.

"Students who have been cited for distinguished scholarship are permitted to register first without regard to their alphabetical position.

"Students who maintain exceptionally high standards of scholarship throughout their course are graduated 'with distinction,' suitable acknowledgment being made at graduation and a letter of certification being given by the President of the University."

The scholarship index is obtained by the following formula:

$$\frac{6.5\,H + 5A + 4B + 3P + 2C + 1D + 1F}{H + A + B + P + C + D + F}$$

The grades given at Purdue are H passed with high honor, A passed with honor, B passed with merit, P passed, C conditioned, D failure and must repeat the course, and F failed for absence. The formula means that the total semester hours of H, A, B, etc., are multiplied by their respective unit and the total sum is divided by the sum of the hours of work taken. If this index is 5 or above the student is then eligible for the Distinguished List.

To complete our consideration of the orientation tests it is fitting that we present the status of the Pharmacy students in percentile rating on the Distinguished List as compared to the balance of the students in the University. This has been carefully checked for nine of the past ten semesters; the last report has not yet been published. Because of the large amount of tabulation necessary to present the facts, the totals have been compiled in Table VI which shows the position of each class as compared to all schools in the University.

This may be interpreted as follows: The Pharmacy class entering in 1926 and graduating in 1930 ranked the lowest in percentage on the Distinguished List of the University during the first three semesters in school, in the fourth semester they were seventh, lowest in the next semester, seventh in the last semester of their Junior year and lowest during their Senior year. There is one outstanding group, the class of 1928 to 1932. This group ranked high in every semester and as a whole it is an outstanding group of students.

According to the orientation tests of the freshmen class of 1930–1931, the group should rank high on this Distinguished List, and the results obtained so far seem to bear out our assumption. They ranked third in the University the first semester and we are of the opinion that they have retained the same rank in the second semester, although the List has not been published at this time.

It is well to state that no student has been reported on the Distinguished List in the past five years whose orientation average was below 30. Sixty-four and three-tenths per cent of those students in Pharmacy whose names appeared on the Distinguished List were from the group having an average of 50 or above on these orientation tests.

The incoming freshmen of 1930–1931 all enrolled in the four-year course in Pharmacy and, after a study of their orientation grades, there seems to be distinct indications that they have been better trained in the fundamentals. This group had the highest percentage of their number with a score of over 50 in the School of Pharmacy during the past five years, there being a total of 42.8% of the group with an average above 50, 68.6% above 30, 77.2% above 20 and only 5.7% below 10. The mortality of this group should be low as compared to that of previous years.

In conclusion, the orientation tests have been of value to us in sectioning students, in predicting their performance, in determining the load that should be assigned and in comparing the mental ability of students entering Pharmacy with students entering the other schools of the University. The results show that students entering the shorter course in Pharmacy have been below the average and that students entering the four-year Pharmacy course showed, this year, a great improvement. What will happen hereafter we cannot say, but we are optimistic enough to predict that this improvement will continue.

PLACE AND PURPOSE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AMONG PHARMACEUTICAL ORGANIZATIONS.*

BY J. H. BEAL, FORT WALTON, FLA.

In a society in which powerful combinations are universally relied upon to influence public policies, the ability of a numerically small and unorganized group to make itself heard above the general clamor is pitifully small.

Assuming a total of 120,000 registered pharmacists in a census of more than 120,000,000 people, a ratio below one to a thousand, or less than one-tenth of one per cent, the chance of the individual pharmacist to influence legislative and administrative policies is practically zero.

Whatever has been accomplished to give pharmacy place and standing has been solely through the efforts of a comparatively small section of this tenth of one per cent. Consider what might be accomplished if we could count upon the genuine and intelligent coöperation of a majority of pharmacy's scattered units!

NUMBER AND WEAKNESS OF PHARMACEUTICAL ORGANIZATIONS.

Apparently there is no scarcity of pharmaceutical organizations. There are possibly several hundred city, county and other local societies, nearly half a hundred state associations, and almost a dozen societies of national scope, but it is estimated that less than one-third of those on the rolls of registered pharmacists are dues-paying members of their state and national associations. Organizations are numerically abundant, but the degree of organization is slight. The machinery is ample but the motive power is woefully inadequate—like a thousand-ton liner with the power plant of a dingey.

The great problem of pharmacy to-day is to discover some effective means of reaching the great mass of non-coöperating druggists and of successfully per-

* Presented at Florida State Pharmaceutical Association, June 14, 1932.

suading them that their duty to their calling and their self interest require them to become active supporters of their state and national organizations.

PHARMACY IS BOTH TRADE AND PROFESSION.

Much time and energy have been spent in a discussion of the question whether pharmacy should be classed as a profession or as a variety of tradesmanship. A simple answer to the question is that it is both.

Anciently it was the fashion to restrict the term "profession" or "learned profession" to occupations which implied the possession of a liberal education, and the practice of which involved mental rather than manual labor, as the professions of law and divinity. In more modern times it has become customary to apply the term to any occupation for which preparation is made by pursuing a special course of study at a college or university, regardless of whether the practice of the occupation involves the performance of manual labor or not, under which more liberal interpretation numerous occupations, as medicine, surgery, dentistry, engineering, etc., are regarded as professions. And since preparation for the practice of pharmacy now requires the completion of a liberal college course of study, it likewise is entitled to be regarded as a professional occupation.

We recognize, however, that the pharmacist is constantly called upon to discharge two classes of functions. Of the pharmacist's activities we may regard as professional—*i. e.*, as pharmaceutical—those which require the technical knowledge and skill that can be acquired only through a special course of study and experience. When his activity is one that does not require any degree of skilled manipulation, or any degree of training other than the ability to read a printed label, the performance is as much a commercial transaction as if performed by a grocer or hardware merchant.

When a salesman takes from a shelf a finished and properly labeled package and hands it to the purchaser, the act is that of a seller of drugs or drug merchant. When, however, he goes to the general stock of drugs and measures or weighs out and labels a portion of a particular drug he is performing an act which is pharmaceutical in character, since if he is not trained in technical terminology and does not possess the special knowledge necessary to select the proper drug he may dispense tartar emetic instead of rochelle salt, white vitriol instead of magnesium sulphate, or make any one of a hundred other possible mistakes that would result in diastrous consequences to his patrons.

In short, the pharmacist is a professional man when he practices pharmacy, properly so-called, and a merchant when he handles packaged and properly labeled drugs as merchandise.

OUR TWO NATIONAL ORGANIZATIONS.

Corresponding to the two varieties of activities of retail pharmacy, commercial and professional, we have two great national organizations, the National Association of Retail Druggists and the AMERICAN PHARMACEUTICAL ASSOCIATION.

As indicated by its name, the National Association of Retail Druggists represents specifically the interests and especially the economic interests of the retail druggist, just as the N. W. D. A. represents specifically the interests of the wholesalers.

This fine association of retailers, numerically the largest drug organization in the world, because of its consistent championship of the special interests of the retailer, as for example in its support of the Capper-Kelly Fair Trade Bill now pending in Congress, as well as because of its many other important activities, deserves the gratitude and loyal support of every retail druggist in these United States.

The AMERICAN PHARMACEUTICAL ASSOCIATION, on the other hand, is mainly concerned with the cultivation of the scientific and professional interests of the entire field of pharmacy, and admits to membership not only retail druggists, but wholesalers, manufacturers, professors in colleges of pharmacy, or individuals connected with any other legitimate branch of pharmacy.

These two great national organizations are not rivals, but friendly co-workers for the advancement of pharmacy. While each has a special line of work to which it mainly devotes its efforts, there is also a wide zone of common interests where the two work hand in hand. Their executive bodies regularly meet in joint sessions for the consideration of problems common to both; the leading members of the N. A. R. D. are usually also active members of the A. PH. A. and sometimes the same individuals hold official positions in both societies.

HISTORY AND MAIN OBJECTIVES OF THE A. PH. A.

As the N. A. R. D. is the largest, so the A. PH. A. is the oldest pharmaceutical association in America, and one of the oldest in the entire world. Founded by a group of able pharmacists in New York City in 1851, it is now in the 81st year of its existence, a fairly venerable age in a country as young as ours.

The record of its work is contained in 59 volumes of Proceedings, 16 volumes of the Year Book, 6 annual volumes of the Bulletin, and 21 volumes of the monthly JOURNAL, comprising in all more than a hundred volumes of publications, and containing nearly a hundred thousand printed pages, one of the most extensive and most valuable compilations of practical and usable information issued by any professional organization.

During its existence of four-fifths of a century the ASSOCIATION has enjoyed the membership, and has received the benefit of the best minds in American pharmacy. It started out with four well-defined objectives in view, the promotion of legislation, education, organization and of scientific research, all in pharmaceutical lines, and its activities to-day consist mainly of an elaboration and expansion of that original first program.

A. PH. A. WORK IN LEGISLATION.

From the beginning constructive work in legislation has been one of the major activities of the ASSOCIATION. Foreign laws concerning adulteration of drugs, governing the sale and labeling of poisons, and regulating the practice of pharmacy were obtained and studied. Models of laws were prepared in such form as it was believed would adapt them to American conditions, and were circulated among druggists of the United States, and these models have been amended from time to time to bring them into conformity to changing views.

As a consequence every state pharmacy act and every poison label act in force in the states to-day are either copies of, or modifications of these original A. PH. A. model laws.

When the abuse of habit-forming drugs became a public issue, the A. PH. A. through a committee, prepared the draft of a Model Anti-Narcotic Law which, either in whole or in modified form, has found its way into the statute books of every state.

When the time came for legislation of national character upon the subject, it was the A. PH. A. which called together the National Drug Trade Conference, a committee of which drafted and secured the passage by Congress of the Federal habit-forming drug law known as the Harrison Act.

When the Federal Food and Drugs Act of June 30, 1906, was being drafted it was members of the A. PH. A. who procured the insertion in that act of principles and provisions which the A. PH. A. had at one time or another worked out and approved.

It may therefore be said that in a large and comprehensive way the A. PH. A. has been either the source or inspiration of all legislation affecting the practice of pharmacy, the regulation of the sale of poisons and habit-forming drugs, or relating to the adulteration of drugs, in existence in the United States to-day.

A. PH. A. PROMOTED ORGANIZATION OF STATE ASSOCIATIONS.

The A. PH. A. early realized that to carry out its program for the improvement of pharmacy would require the assistance of local and state associations, and it adopted as one of its major tasks the creation of such organizations. At every annual convention its members were urged to take immediate steps for the creation of associations in their respective states, and all of the early state organizations originated in this manner.

When in course of time it became apparent that a separate national organization was needed to look after the specific interests of the retail druggists, the A. PH. A. instead of discouraging the movement strongly supported it. If you will examine the roster of that historic meeting in the city of St. Louis, when the N. A. R. D. was founded, it will be discovered that the officers and committeemen of the new body almost to a man were active members of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Consistently from its very beginning the A. PH. A. has stood for the thoroughgoing organization of the scattered units of pharmacy. It took the initiative in calling together the Conference of Pharmaceutical Faculties, now the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, the National Drug Trade Conference, the Association of State Association Secretaries and other similar bodies.

As at present constituted the A. PH. A. is a compound organization, or an Association of Associations, or more properly speaking a Federation. Its principal governing body is a House of Delegates, consisting of delegates from all state pharmaceutical associations and from all recognized national, pharmaceutical and drug organizations.

As representatives of the state associations predominate numerically in the House of Delegates, it may be said that the future of the A. PH. A. lies in the hands of these state societies.

THE ADVANCEMENT OF PHARMACEUTICAL EDUCATION.

Pharmaceutical Education was likewise one of the important tasks to which

the A. PH. A. early directed its efforts. As the majority of the founders of the ASSOCIATION were college men it was natural that they should regard the proper education of the pharmacist as a matter of first importance, and one of the earliest determinations of the society was that there should be a college of pharmacy established in each state as rapidly as the increase in population would make its support possible.

At an early date in its history the ASSOCIATION approved a college curriculum which would be creditable even to-day. It has constantly fostered the progress of education, labored for the advancement of the standards for the registration of pharmacists, and given encouragement and support to the colleges of pharmacy.

THE PROMOTION OF PHARMACEUTICAL RESEARCH.

Research has always been one of the principal features of the ASSOCIATION program. Researches respecting the origin and identification of drugs, the study and separation of their active constituents, the devising of new methods of extraction, and their standardization as to active constituents have been contributed by hundreds of the ablest men American pharmacy has produced.

As an aid to research the association has for many years published an annual "Report on the Progress of Pharmacy," in which there has been brought together a summary of the work of the pharmacists, chemists and botanists of every country. At first published as a part of the annual volume of bound Proceedings, and now continued in the Year Book, this Report is a compilation of information relating to pharmacy and its collateral subjects, the value of which can be appreciated only by those who have used it.

WORK ON THE U. S. P. AND N. F.

If the A. PH. A. had accomplished nothing more, it would be entitled to the lasting gratitude of the drug trade for its work in securing the continuance of the U. S. P. as an authoritative standard of the medical and pharmaceutical professions.

The U. S. P., as is well known, was established by the medical profession in 1820, and led a more or less languishing existence for about 50 or 60 years. In the eighteen-eighties the production of proprietary specialties by manufacturing houses had grown to such an extent that physicians had ceased to feel the need of an official standard for drugs and medicines. Interest in the Pharmacopœia had fallen to such a low ebb that it was seriously proposed either to abandon the work of its periodical revision, or to turn the whole publication over to a private publishing concern. It was at this point that leading members of the A. PH. A., as Dr. Chas. Rice, Edward R. Squibb, Professor Joseph P. Remington, Albert E. Ebert, S. A. D. Sheppard, and others, came forward with plans for the resuscitation and revision of the official standard that would make it a fit representation of the best thought in pharmacy and medicine.

In like manner the National Formulary, previously a recipe book of local repute, was taken over by the A. PH. A. and converted into the splendid national standard for preparations and drugs in use but not recognized in the U. S. P. that it now is.

To crown its work upon the Pharmacopœia and National Formulary the A. PH. A. through certain of its members, procured the recognition of these two

standards by the Food and Drugs Act of June 30, 1906, which has generally been followed by state enactments, so that the entire drug trade has been saved from the arbitrary standards which might possibly have been inflicted upon it through officious bureaucratic methods.

THE AMERICAN INSTITUTE OF PHARMACY.

Some years ago the AMERICAN PHARMACEUTICAL ASSOCIATION began the collection of funds for the erection of a building in which could be housed the offices of the association and which, at the same time, would serve as a National Monument to scientific and professional pharmacy. All branches of the drug trade have contributed to the fund, which now amounts to something over a quarter million dollars.

A beautiful design has been adopted, and it is expected that before the present year is ended there will begin the erection of the American Institute of Pharmacy. The institution will be located on one of the most beautiful sites in the City of Washington, and within easy reaching distance of the Lincoln Memorial and Washington Monument.

In the building will be housed the offices of General Secretary, Editor of the JOURNAL, and Reporter on the Progress of Pharmacy, an historical library, various research laboratories for work on Pharmacopœial and National Formulary problems, an historical museum, showing the development of pharmacy, etc., etc. The structure will be of classic design, in keeping with U. S. Government Buildings, and will be one of which every American pharmacist can be justly proud.

UNIVERSALITY OF A. PH. A. SERVICE TO PHARMACY.

The AMERICAN PHARMACEUTICAL ASSOCIATION has been a principal factor in the development of pharmaceutical organization, legislation and education in the Western World. It has promoted research, inspired higher professional ideals and has exerted a constant and powerful influence for the advancement of every phase of the science and art of pharmacy.

Quoting from a paper presented to the Ohio State Pharmaceutical Association by the present writer more than thirty years ago:

. . . . . "there is not a single field of pharmaceutical activity into which it [the A. PH. A.] has not entered and done valuable work; scarcely a problem ethical or practical to which it has not given serious attention; hardly a matter of general interest to our profession to which it has not made contributions of value; and there is not a single individual connected with legitimate pharmacy in any of its branches who is not debtor to it for substantial benefits received. Everywhere it has been a positive force for good; conservative in action, ethical in its purposes, and exerting a powerful influence for the betterment of every branch of a profession that is one of the most useful divisions of human activity, if not the most honored and lucrative."

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

President, A. L. I. Winne, Richmond, Va. *Treasurer*, J. W. Gayle, Frankfort, Ky. *Chairman of Executive Committee*, H. M. Lerou, Norwich, Conn. *Secretary*, H. C. Christensen, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Indiana	Montana	Rhode Island
Alaska	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
		Porto Rico	

A MESSAGE FROM THE PRESIDENT.

Dear Board Members:

In about another month the dates of our next annual convention will have arrived and pharmacists from all sections of the United States and Canada will be gathering in Toronto. Board of Pharmacy members from the various states will gather there on August 22nd and 23rd to hold their 29th annual meeting and we hope to make it one of the most representative gatherings in our history.

The National Association Boards of Pharmacy has passed the quarter-century mark of accomplishment some several years ago and is now approaching a third-of-a-century of constructive activity. During the years that have passed it has accomplished much but there yet remains much to be done. The motivating force that has carried the organization on through the years has been directed principally to securing effective general reciprocity in pharmacy registration among the various states of the Union, the establishment of reasonably uniform pharmacy laws, the maintenance of a reasonably uniform pharmacy licensure test in the several states and the maintenance of high educational standards in pharmacy. To a large extent these things have been brought about, yet there remain portions of this program not yet fulfilled and portions of the country where but a small portion of this program has become effective. Eternal vigilance and constant work are necessary attributes in the fulfilment of the ends desired and the expressed views of the many as provided for in annual conventions is highly desired, and makes for the accomplishment of the ends for which we are striving. I therefore urge upon every board member in the United States who can possibly do so to be present at our forthcoming Toronto meeting.

This meeting in our neighboring Canadian city is our first ever to be held on foreign soil, if we may so speak of the homeland of our good neighbors to the north. I can assure all board members that they will be hospitably received in Toronto and made to feel perfectly at home there. We will have with us as our guests many of

the Canadian pharmacy examiners and will be privileged to learn the viewpoint of those who conduct pharmacy licensure under somewhat different conditions from those obtaining in the States.

Remember the dates and make your plans to be present. Aside from the interesting business transacted by the N. A. B. P. we have other attractions of various A. PH. A. allied activities. Apart from the convention activities Canada offers exceptional vacation attractions. We confidently look forward to seeing you in Toronto.

Fraternally yours,
A. L. I. WINNE, *President.*

OBITUARY.

H. LIONEL MEREDITH.

H. Lionel Meredith, president of the National Association of Boards of Pharmacy, 1924–1925, and one of its most loyal workers during the early days of the organization, died at his home in Fort Pierce, Fla., on Saturday, May 7, 1932, after an illness of several months. He was fifty-eight years of age.

He was graduated from the Philadelphia College of Pharmacy and Science in 1900, with highest honors, later attending the University of Pennsylvania, and was recalled by his *Alma Mater* in 1923 to receive the honorary degree of Master of Pharmacy.

He served as a member of the Maryland Board of Pharmacy from 1903 to 1925, when he resigned to take up his residence in Florida. In 1903, he served as president of the Maryland Pharmaceutical Association.

The N. A. B. P. proceedings reveal the record of his achievements in the field of reciprocity. He was an earnest fighter for what he believed to be right. His presidential address in 1925 is an outline of the ideals for which he stood, many of which he succeeded in writing into the code of the Association. Truly, few men have done as much as he has. The N. A. B. P. grieves his passing. He leaves a niche that cannot be filled.

STATE BOARD NEWS.

Connecticut.—Chairman H. M. Lerou, of the N. A. B. P. Executive Committee, recently retired from the Connecticut Board of Pharmacy after completing fifteen years as a member of the Board and fourteen years as its secretary. His associates presented him with a beautiful desk-set as a token of their esteem. The Connecticut College of Pharmacy, of which he is a trustee, honored him with a Doctor of Pharmacy degree.

Hugh P. Beirne was elected *Secretary* of the Board. The other officers for the ensuing year are as follows: *President*, Louis Montanaro; *Vice-President*, George F. Blackall. Mr. Blackall succeeds Mr. Lerou.

Secretary Beirne has just retired as president of the Connecticut Pharmaceutical Association, having presided at the meeting held in June of this year.

New Jersey.—The recent reversal of the District Court verdict of "Not Guilty" on the Hutchins case by the Supreme Court reëstablishes the fact that Sweet Spirit of Nitre and Essence of Peppermint are medicines and must be sold in New Jersey only under the supervision of a registered pharmacist. This new decision should prove very helpful in combating the so-called patent medicine stores. The question in this case was whether these two products were classified as medicines or not. The lower court held that they were not medicines and therefore their sale

should not be restricted. The higher court reversed this decision scoring an important victory for pharmacy.

The New Jersey Board of Pharmacy recently elected the following officers for the fiscal year beginning July 1, 1932: *President*, C. Graham McCloskey; *Vice-President*, James J. A. Bauman; *Treasurer*, Albert J. Smith; *Secretary* and *Chief Chemist*, Dr. Robert P. Fischelis.

The next meeting of the Board for the consideration of applications for registration by reciprocity will be held in the State House, Trenton, on July 21st.

In accordance with the custom established a short time ago, ceremonies incident to the award of certificates were held on June 28th at Trenton. Seventy-eight certificates were awarded to those who passed recent examinations.

West Virginia.—Owing to the recent death of Alfred W. Walker, for many years secretary of the West Virginia Board of Pharmacy, Roy B. Cook of Charleston, W. Va., is serving as secretary. All inquiries should be addressed to him at Box 710. The July examination was held at Woodburn Hall, University of West Virginia, Morgantown, on the 11th and 12th.

PROGRAM OF TWENTY-NINTH ANNUAL CONVENTION.

Officers: *President*, A. L. I. Winne, Richmond, Va.; *Secretary*, H. C. Christensen, Chicago, Ill.; *Treasurer*, J. W. Gayle, Frankfurt, Ky.

PROGRAM.

MONDAY, AUGUST 22ND, 9:30 A.M.—*First Session.*

1. Call to Order, President Winne.
2. Roll Call.
3. Appointment of Committee on Credentials, President Winne.
4. Welcome and Recognition of Canadian Guests, President Winne.
5. President's Address, A. L. I. Winne.
6. Appointment of Committee on President's Address, Acting Vice-President.
7. Report of Executive Committee, H. M. Lerou, *Chairman.*
8. Report of Secretary, H. C. Christensen.
9. Report of Treasurer, J. W. Gayle.
10. Report of Committee on Constitution and By-Laws, F. H. King, *Chairman.*

MONDAY, AUGUST 22ND, 2:30 P.M.—*Second Session.*

1. Report of Department of Education, R. L. Swain, *Director.*
2. Report of Legislative Committee, R. L. Swain, *Chairman.*
3. Report of Committee on Credentials.
4. Appointment of Nominating Committee, President Winne.
5. Report of Advisory Examination Committee, H. C. Christensen, *Chairman.*
6. Report of Syllabus Committee, R. L. Swain.
7. Report of Committee on National Legislation, J. W. Wise, *Chairman.*
8. Report of Committee on Pharmacy Ownership Law, George W. Mather, *Chairman.*
9. Verbal Reports of Vice-Presidents:

District No. 1—C. Thurston Gilbert	District No. 6—Booker T. Latimer
District No. 2—Robert P. Fischelis	District No. 7—John K. Clemmer
District No. 3—Clare F. Allen	District No. 8—Joseph P. Murray
District No. 4—J. W. Slocum	District No. 9—Arthur Lee Phelps
District No. 5—W. L. Lyle	

10. Report of Committee on Banquet Arrangements, W. M. Hankins, *Chairman.*

N. A. B. Banquet, Monday, August 22nd, at 6:00 P.M.

TUESDAY, AUGUST 23RD AT 9:00 A.M.

Joint Session with American Association of Colleges of Pharmacy, Special Program with Canadian Educators and Examiners Participating—to be announced later.

TUESDAY, AUGUST 23RD AT 2:30 P.M.—*Final Session.*

1. Report of Committee on President's Address.
2. Report of Publicity Committee, Fred D. Pierce, *Chairman.*
3. Report of Committee on Prerequisite Legislation, William R. Acheson, *Chairman.*
4. Report of Grievance Committee, H. G. Ruenzel, *Chairman.*
5. Final Report of Committee on Constitution and By-Laws, F. H. King, *Chairman.*
6. Reports of Special Committees.
7. Unfinished Business.
8. New Business.
9. Report of Nominating Committee.
10. Election and Installation of Officers.
11. Adjournment.

ECONOMIC FACTORS IN RECIPROCITY.

BY H. C. CHRISTENSEN.

The accompanying chart showing reciprocal licenses granted during the period from June 30, 1930, to July 1, 1931, makes an interesting study not only for board and college faculty members but also for pharmacists.

In a majority of the states, the number of those entering the state and those leaving the state by reciprocity is almost equal, thus maintaining a balance. A decided tendency toward efflux (outgoing) reciprocity is noted in fourteen states, while a tendency toward influx (incoming) reciprocity is noted in nine states. These figures, it should be remembered, cover the period 1930–1931. A similar compilation covering the period 1931–1932 is not possible until some time after the fiscal year has been closed. In other words, these figures should not be taken as the present trend. Some of the states in the efflux classification may be found in the equal or influx classification for the period 1931–1932.

Reciprocity provides a quick and safe method of adjusting supply and demand. With the shifting of population in these modern times, there must be a method of effecting these readjustments, otherwise serious conditions of either oversupply or shortage arise. The latter condition is the more serious, as it takes an average of four and one-half years' time to train and license a pharmacist. The board of pharmacy has no legal right to regulate supply and demand; in fact, such manipulation is dangerous, as it increases the complexity of the problem. Reciprocity is therefore a great boon, as it provides a legal method of making these readjustments and maintaining an equilibrium based on supply and demand.

A study of the states in the efflux classification (with considerably more pharmacists leaving the state by reciprocity than those entering) shows that most of these are states that have been on a low educational requirement basis. Naturally, these states build up an oversupply of pharmacists who migrated there to take examination. Fortunately, the reciprocal system has been so designed that they are not eligible for transfer to but few states, hence they are forced to remain in the state of examination until they find an opportunity elsewhere. Reciprocity does not permit evasion of the law, as it guarantees to all states the right to enforce their standard of requirements. This situation of oversupply should be an incentive for the low standard states to enact college prerequisite laws.

There are also some graduate states in the efflux column, but in these there seems to be a particular local situation which accounts for the oversupply. In

Alabama, for example, the flood wiped out many pharmacists who lost businesses and homes and have been obliged to seek employment outside of the state. The depression was felt in the Dakotas first, because of the wheat and agricultural situation. An interesting question arises over the fact that Indiana, Ohio and Pennsylvania should be found in this column, when there seems to be no definite or visible reason. In view of the fact that these three states have four or five colleges to serve a limited population, the question naturally arises whether too many graduates are being registered in these states. This may not be true. However, if these states remain in the efflux classification over a period of years, there may be some justification for this thought.

In the influx classification (states taking in by reciprocity considerably more than are being sent out), we find most of the southwestern states, where new country is being developed. Small towns are springing up which need pharmaceutical service. We also find a few states of the opposite type—large city classification—such as Illinois, Minnesota and New Jersey. Here again, shall the college situation be considered as a factor? These three states have a large population to serve and only one college within the state to train pharmacists. Even residents are sometimes forced to attend college in a neighboring state, and therefore often take the board examination with the graduating class in that neighboring state, later reciprocating back home. There can be no criticism of this, as most students prefer to go through the examination ordeal with their own class. They are, however, penalized to the extent of being required to practice a full year subsequent to registration in the state of examination before being eligible for reciprocity with the home state. Florida is another state on the influx list. This may be due to the fact that Florida has many retail businesses which operate only six months out of the year, and as the income does not permit supporting a family for an entire year, there is a considerable demand for transient pharmacists during certain periods of the year. Many of these, however, practice only one season and then leave, thus no permanent oversupply is built up.

The main purpose of this study is to bring out the fact that reciprocity is a stabilizing force. Individual pharmacists, state pharmaceutical associations and even boards of pharmacy sometimes express opposition to reciprocity, more particularly during these difficult times with unemployment prevailing. The sentiment is sometimes expressed that reciprocity should be cut off temporarily to give the "home" pharmacists preference in existing vacancies. The truth of the matter is that there are very few vacancies at present. There is little, if any, competition from reciprocal applicants. The average cost of a reciprocal license is $50—$25 for the official blank plus the state license fee which varies from $10 to $50. Obviously very few unemployed pharmacists care to invest this sum of money on the mere possibility of getting a job. Also, it is more difficult for the man at a distance to get the job competing against residents. Therefore, anyone who can secure employment under such conditions, usually is deserving. Then, too, the humanitarian point of view should have consideration—there is often an essential reason for transfer, such as family ties, poor health requiring a change of climate, an opportunity to start in business, etc.

The way the unemployment situation can be alleviated is to create new vacancies, and these can only be made by more rigid law enforcement. The general

tax situation has cut the operating budgets of all law-enforcing bodies, and the law cannot be enforced without adequate inspection. With many businesses operating at a loss, there is a tendency to take advantage of this lessened supervision by cutting down on the pay roll. This should not be permitted, however, when it works to the detriment of the public welfare.

The National Association of Boards of Pharmacy during the fiscal year 1931–1932 has issued only one-half the usual number of official applications, which proves the contention that reciprocity is based strictly on supply and demand. Therefore, there is no necessity for setting up barriers against reciprocity, as the demand for reciprocity is equal to the demand for pharmacists.

RECIPROCAL INTERCHANGE, JUNE 30, 1930 TO JULY 1, 1931.

To \ FROM	Alabama	Alaska	Arizona	Arkansas	Colorado	Connecticut	Delaware	Dist. of Col.	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Porto Rico	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Total
Alabama									5			1						2				1																1		2										12
Alaska																																																	
Arizona				3								1	1		2	2	2			1		1		2	1				2				1					1		1	1	4	1					2		25
Arkansas																	1																																	1
Colorado			1	1								1	1	3							1	2		4	2				1				2	1															21
Connecticut												1								5									1				1						2		1	1							15
Delaware																																						2											2
Dist. of Col.	1			1		1			1	3		1				1	1		7			1	1						2	1			3					2	2	1				4		1			26
Florida	3					1		1		15			3				1				1								3	1			1						3		4			1					43
Georgia	3																1																						3		1	1							10
Idaho			1																						1																								2
Illinois	1			3	1	1			1	1	4		30	11	1	3				5	2	15		1									3	1	1	4					1				1	4		85
Indiana												2				1				5	1																												14
Iowa									1			2			1									4										1	1														10
Kansas																								6	2									1									1						10
Kentucky				1					1	3		1	3				1																3	1	1													14
Louisiana	1			2						2		1	1									1																												10
Maine																			3																							1							4
Maryland					1			5																										1							2				1	3			15
Massachusetts								1									4											3	1					1							5								15
Michigan												2	3	1		1				1									1					2	1											1	3		16
Minnesota												1	4											1		1								5							2	1					4		20
Mississippi	1		1	1					1														1										1															6
Missouri				2	1			1				5	2		4		1			1	1		1		1									1	1							2				1			25
Montana																									2									1	1	1										2			8
Nebraska				3									2	6	2						1																								1		1		17
Nevada				1										2																				1											1			5
New Hampshire																			2	2																													4
New Jersey					3				1			1								1	1													1	1						20		1				1		31
New Mexico		1		1									1		1										2																								4
North Carolina								1		2			1			1																														2				7
North Dakota																																																	1
Ohio													2	1		1					1				2																								7
Oklahoma	1			8				1	1	2		1	2	3		1					1	1	8																											28
Oregon												1	1												1									1																4
Pennsylvania							1						1						4		1								1					2															8
Porto Rico																																																	0
Rhode Island						1													4																															5
South Carolina									1																								1																2
South Dakota																																																	0
Tennessee	6			5					5							2					1	2																					1						25
Texas	3		1	10	3			1	6		1	8		4	14							3	2				1	12			2		2								7					1	1	66
Utah										1														1																										2
Vermont																																																	0
Virginia																			1																4					2				2					9
Washington														1																																				1
West Virginia								1								1					1					1	1																				1			10
Wisconsin									1			4	1							1	2	1		1											2											1				14
Wyoming				1																				1											2									1						5
	25	0	5	40	15	8	1	13	6	90	3	37	48	59	22	13	23	7	14	19	21	8	20	41	6	13	3	8	16	11	23	11	6	59	7	11	17	9	31	17	2	6	15	9	10	14	1		768

Those who would temporarily shut off reciprocity, in many instances overlook the fact that when this is done, they also prevent their own pharmacists from leaving the state. With the incoming and outgoing reciprocal registrations practically equal in a majority of states nothing would be gained as the outgoing reciprocity would cease. Such action would be harmful, as it would prevent pharmacists of the state from accepting opportunities elsewhere. Also, those proprietor-pharmacists desiring to sell would be limited to prospects within the state. No outsider would purchase a business, knowing that he would have to prepare for an examination and perhaps wait months for a license.

Economists agree that there is no time like the present for starting in business, as the amount of capital required has been materially decreased.

In analyzing the reciprocal applications issued during the past year (statistics not ready on this as yet), it has been found that a goodly per cent come from pharmacists who are leaving for small towns in other states where a business opportunity has been offered them. Some have failed in larger centers, but managed to save enough to start all over again in a small way. Should they be denied this opportunity? Others come from clerks who have saved money for years, escaped bank failures and are now ready to invest in a business of their own at present bargain prices. Often such a purchaser saves the seller from bankruptcy. By refusing him a reciprocal license, state associations or boards, in the suggestion to temporarily abandon or reduce the number of reciprocal applications, may be doing more harm than good to their own pharmacists.

Pharmacy is the first, and one of the few professions to work out a successful system of reciprocity on a truly national scale. Forty-nine boards interchange licenses through the N. A. B. P. This includes all the states with the exception of California and New York; Alaska, Porto Rico and the District of Columbia are also members. The pharmacists who argue against reciprocity now are of the type who would be the very first to complain if they wanted reciprocity elsewhere and could not obtain it. The greatest good for the greatest number should govern, not the selfish point of view.

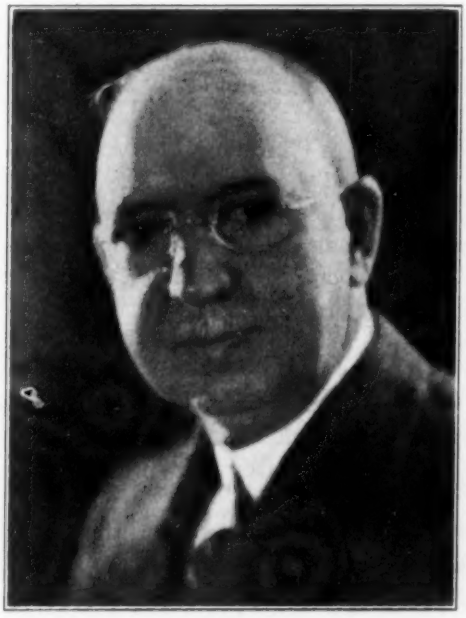
Without reciprocity, it can readily be seen that situations would arise from time to time, detrimental both to pharmacy in the state and the individual pharmacist. There would be no outlet whatsoever in the states with an oversupply. And at the same time, there would be states with an acute shortage, which could not be remedied. The latter condition existed during the war and was greatly alleviated by reciprocity. A pharmacist cannot be trained in a short time. A condition of shortage is far more dangerous to the public health than one of oversupply as unqualified help will be used. Even at present, there is probably less unemployment in pharmacy than in most other lines of endeavor. With the four-year course taking effect for matriculation in 1932, the number of pharmacists trained will probably be less, thus preventing the growth of oversupply. During trying periods of readjustment, reciprocity is even more necessary and should be encouraged. The sooner the local conditions are readjusted, the sooner the national situation will improve, and then the international situation. We have progressed beyond the point where any state or any nation can build a wall of self sufficiency around itself. Rapid travel and communication make coöperation between states and nations absolutely essential.

A great many mistaken impressions about reciprocity seem to exist. It would seem to be the duty of the National Association of Boards of Pharmacy to correct these and defend the cause of reciprocity. For example, there are those who think that a license in one state will entitle them to reciprocity in any or all states. This is decidedly untrue. Such a system is legally impossible, as it is in violation of the Constitution of the United States which grants to each state the right to make and enforce its own laws—the well-known doctrine of states' rights. The reciprocal applicant, in order to be eligible, must possess such personal qualifications and credentials as would have entitled him to take examination in the recipient state at the time of his examination elsewhere. Therefore, the non-graduate who desires to practice in a graduate state and takes examination in a non-graduate state with

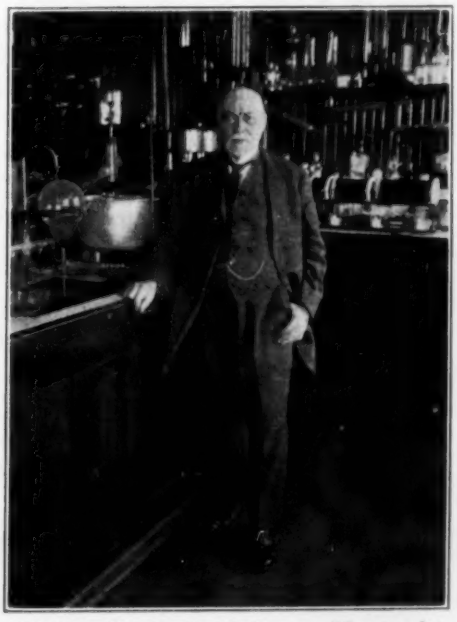
the hope of reciprocating later with a graduate state is only wasting time and money. He is barred. Reciprocity does not sanction such evasion of the law.

This, however, does not mean that only graduate pharmacists are eligible for reciprocity with graduate states. If a pharmacist registered in Arizona, let us say, in 1905 who is not a graduate in pharmacy and he desires a reciprocal license in Pennsylvania, which has required college graduation since 1906, he is entitled to it and is eligible. His registration prior to the enactment of the Pennsylvania college requirement exempts him. This has sometimes been criticized by those who would limit reciprocity to graduates only. Such action would be an injustice, as it would be just as fair to cancel all outstanding licenses of non-graduates in the state when the college prerequisite law is enacted. Legally no requirement can be made retroactive and stand the test of the courts.

The N. A. B. P. office at 130 N. Wells St., Chicago, maintains a free information service on reciprocity for pharmacists. Any inquiries will gladly be answered. The only time that a charge is made is when the official application is issued. Those who contemplate making a change in the future are urged to write for the preliminary information blank before they make definite plans. This can be filed without fee and opinion will be given as to eligibility in any given state. As there is considerable work required to check on eligibility in one state, pharmacists are requested to limit inquiries to one or two states and not to ask for a list of all states in which they are eligible. The latter service cannot be rendered on account of the amount of time and expense involved. The best advice that can be given to any pharmacist contemplating a transfer is not to make any plans until he knows whether he is eligible.



Dr. E. H. Cary, President of American Medical Association.



The late Dr. Frederick Power, Pharmacist head of Government Phytochemical Laboratory, for a decade. (See April JOURNAL, 1927.)

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

"The following papers on 'Content of the Course in Pharmaceutical Arithmetic' and 'Problems Confronting the Teacher of Dispensing Pharmacy' were presented at the Teacher's Conferences last year. They are called to the attention of the teachers who are in charge of these courses. Both subjects are very important and discussion of these papers is invited.—C. B. JORDAN, *Editor*."

PHARMACEUTICAL ARITHMETIC: CONTENT OF THE COURSE.

BY J. L. KLOTZ.*

With the advent of the minimum four-year curriculum in Pharmacy, some schools are planning to add technical courses in pharmacy; others are giving practically the same curriculum as heretofore with the addition of certain cultural subjects: while a third group will add courses in the allied sciences. To all of these, however, the disposition of the course in pharmaceutical arithmetic is of vital importance. Although in the past a knowledge of the fundamental arithmetical principles has always been a necessity to the pharmacist, we are fast approaching the time when the pharmacist will be required to know far more than has ever before been expected of him. Just as it was requisite for him to calculate the dosage of prescription ingredients, it will soon be necessary for him to conduct the analyses of drugs and chemicals, thus demanding a knowledge of a field of mathematics with which the average graduate of to-day is totally unfamiliar. So, when we consider the changes which are rapidly affecting the profession of pharmacy, it becomes evident that in order to meet these new conditions it is necessary that we alter old procedures and construct newer, more comprehensive courses of study on the solid foundations of the past.

Our first concern in the construction of a course in Pharmaceutical Arithmetic is, of course, where to begin. Although we are entitled to believe that our students are familiar with all fundamental arithmetical principles on their entrance into our colleges and universities, it is the exception rather than the rule for the pharmacy student to demonstrate a mastery of the required subject matter. It becomes necessary for us then, to spend a minimum amount of time in an effort to prepare the student for the simplest pharmaceutical arithmetical procedures. In recognizance of this fact, numerous authors of textbooks on the subject of Pharmaceutical Arithmetic, notably Stevens (1), have devoted a part of their text to a review of the simpler arithmetical procedures. It is evident, therefore, that the first step in the construction of the course must be adequate review in the fundamentals.

Just as the subject of Pharmacy is based upon the Pharmacopœia, the subject of Pharmaceutical Arithmetic is based on the various tables of weights and measures which must be taken up at this point along with sufficient laboratory work to supply the student with a thorough understanding of the principles involved. The

* University of South Carolina, School of Pharmacy, Columbia, S. C.

teaching of various conversion factors for expressing units of one system in those of another is a practice to be discouraged as a knowledge of a few common figures enables the student to conduct these conversions in logical fashion without memorized factors.

The subjects of specific gravity and specific volume follow the weight and measure instruction in the usual arrangement of the course. The science of pharmacy is so integrally held with these two factors that although the subject matter is rather too difficult to be taken up at such an early date, it is almost impossible to undertake further study until this branch has been thoroughly developed. The subjects are usually divided into the following sub-heads: Hydrometers, pycnometers, plummets, hydrostatic weighing, etc., and no attempt can well be made along this line without the addition of laboratory work. At all costs, it is necessary to spend sufficient time both upon the theory and practical applications of this subject to insure a working knowledge of the principles involved.

At some point, preferably as early as possible, it is desirable to include a short consideration of the various devices used to measure temperature. In addition to the three forms of thermometers, *i. e.*, Fahrenheit, Centigrade and Reamur, which are usually considered, a brief discussion of the "absolute scale" as well as the thermocouple and the radiation pyrometer might be of advantage.

We have now progressed to the point of consideration of percentage solutions and alligation, having omitted only one subject, "reduction and expansion of formulas" a topic which is usually developed along with the science of metrology.

Percentage solutions, one of the most important of the various sub-heads of the course, is unfortunately a subject around which a great deal of controversy revolves. Burt (2) has reviewed the various methods of calculation and has recommended the discontinuance of all weight to weight calculations for extemporaneous practice. Regardless of the confusion existing as regards this subject it is of the utmost importance for us to teach all methods to the best of our ability and to emphasize those practicable for use and those which may be prevalent in our respective localities. At this point it is also of value to consider briefly the preparation of percentage solids as well as percentage solutions and it will be found that almost as much confusion exists as regards percentage solids as that surrounding percentage solutions.

Alligation, divided into medial and alternate by most texts on the subject, needs very little discussion. It is a type of calculation peculiar to pharmacy and as such is of as much if not of more value to the pharmacist of the future as to the pharmacist of the present.

Thus, we have briefly considered the majority of the calculations now taught in the course "Pharmaceutical Arithmetic." However, when we consider that our fields of research are constantly broadening and our duties are becoming more diverse, it is evident that these subjects represent only the elements of the desirable course of study. The following paragraphs represent brief discussions of subjects which in the future we shall undoubtedly find it advisable to include either as integral parts of our present course of study, or as the essentials of a new course "Advanced Pharmaceutical Arithmetic."

Logarithms, known as mathematical short cuts, are of inestimable value to the student working in any scientific field. Hours of calculation and tedious multipli-

cations and divisions can invariably be shortened into simple tabulations by logarithmic figures. Many chemical formulas, particularly those of "Physical Chemistry," can be greatly simplified and in fact require a knowledge of logarithms. All gravimetric calculations are greatly simplified by the use of logarithms and in fact few principles of mathematics are more practicable for every-day use than this type of mathematical device. So in broadening our courses, one of the most important of our additions can profitably be made by the inclusion of adequate explanation and application of logarithms to scientific data.

Many courses in Chemistry have at some time in their course of study, exercises in the use of the slide rule. All of the advantages listed in the use of logarithms apply equally well to the slide rule which offers in addition many other convenient types of calculations with little time and effort involved. To the student who is far enough advanced and well enough versed in the fundamentals, the slide rule is a very helpful device in mathematical work. Care must be used, however, to make certain that the student does not learn by imitation the various slide rule settings, but that he thoroughly understands the principles involved before he is introduced to its uses. It is for this reason that the slide rule is not to be recommended for use early in the course but is of advantage to the advanced student.

Since assay work is becoming such an important part of the newer pharmaceutical curricula, it is necessary that some consideration of the calculations involved be given it in "Pharmaceutical Arithmetic." Before a thorough understanding of these calculations can be obtained, the student must be well versed in chemical arithmetic and for this purpose a short review should be given in that subject. All types of gravimetric analysis calculations should be discussed in detail as well as their factors and logarithms. Volumetric analysis reactions, factors, etc., should also be considered and in this connection mathematical factors influencing the choice of indicators would be of great value to the student and facilitate the progress of the various assay courses. Likewise, an elementary consideration of the "Partition Law" as applied to the distribution of a substance between two solvents would simplify the work of the assay course.

The additions to the course which we have herein suggested will undoubtedly call to mind the question "Where will we get time to cover this additional material?" The only available solution to the difficulty is of course the continuance of the subject throughout the year rather than only one semester. Thus we might call the first term "Pharmaceutical Arithmetic," required of all students and the second "Advanced Pharmaceutical Arithmetic" elective for those students intending to go into commercial work or research. In view of the importance of the course, there should be no objection to devoting a full year to its study.

OUTLINE OF PROPOSED COURSE OF STUDY.

1. Review of Fundamentals:
   - *a*. Fractions
   - *b*. Decimals.
   - *c*. Percentage.
   - *d*. Ratio and Proportion.
2. Metrology:
   - *a*. Tables of weights and measures.
   - *b*. Conversion from one system to another.
     - *1*. Factors and their derivation.
   - *c*. Calculations involving metrology.
     - *1*. Reducing and enlarging formulas.
3. Specific Gravity:
   - *a*. Determination methods.
   - *b*. Applications.
     - *1*. Weight to volume.
     - *2*. Volume to weight.

4. Specific Volume:
   a. Determination methods.
   b. Applications.
5. Thermometry:
   a. Thermometer scales.
   b. Thermocouples, radiation, pyrometer, etc.
6. Percentage Solutions:
   a. Weight to weight.
   b. Weight to volume.
   c. Volume to volume.
   d. Calculation from weight of solute.
7. Alligation:
   a. Medial.
   b. Alternate.
      1. Percentage strength.
      2. Specific gravity.
8. Logarithms:
   a. Simple procedures.
   b. Formula application.
9. Slide Rule:
   a. Simple procedures.
   b. Roots.
   c. Logarithms.
   d. Formula settings, etc.
10. Review of Chemical Arithmetic:
   a. Quantities of substances necessary for reaction.
   b. Quantities of substances formed in reactions.
11. Assay Procedures:
   a. Gravimetric factors and their logarithms.
   b. Volumetric solution factors.
   c. Adjustment of volumetric solutions.
   d. Indicator constants.
   e. Choice of indicators.
   f. Distribution of substances between solvents.
      1. Washing of precipitates.
      2. Shaking out alkaloids.

SUMMARY.

1. Suggestions made as to addition of logarithms to course in Pharmaceutical Arithmetic.
2. Suggestion made as to addition of slide rule exercises.
3. Suggestion made as to addition of Gravimetric and Volumetric analysis procedures and calculations involved.
4. Suggestion as to consideration of "Partition Law," methods of measuring heat, theories of indicator choice, etc.
5. Suggestion made as to adding to length of course.
6. Outline of course offered.

BIBLIOGRAPHY.

(1) Stevens, Arithmetic of Pharmacy, *Ed. V.*
(2) Burt, JOUR. A. PH. A., 16 (1927), 1198–1202.

PROBLEMS CONFRONTING THE TEACHER OF DISPENSING PHARMACY.

BY LOUIS WAIT RISING.*

The subject of problems is an age-old one in any field. A number of them are gone over again and again at various annual or more frequently convened gatherings, but because the human mind is what it is—individual—they are never completely threshed out and settled. The points for and against each one are as old and stabilized as the problems themselves, but never can there be obtained a unanimity of opinion for either side.

* Rutgers University, College of Pharmacy, Newark, N. J.

Then, there are always new difficulties creeping in, due to changes in economic conditions, social shifts, altered professional attitudes and ethics. As long as the sea of competitive life remains turbulent we will have this kind. Fundamentally many of them are those our ancestors discussed. But they are as fluid as time and have changed their form to become almost unrecognizable.

So it is with the teaching of Dispensing Pharmacy. The logical assumption would be that the major pedagogic problems of dispensing had been solved long ago. In truth, however, there is always much room for a better coördination of objectives, facts and methods. This is due primarily to the ever-shifting trends in pharmacy. In many ways the demands on the pharmacist are continually changing; it is obvious that they are different now than they were a few years ago, and in consequence our educational program must be elastic in order that it can meet its obligation of up-to-the-minute training. We must graduate people who are equipped with the fundamental knowledge required to most efficiently work out the problems of the particular period in which they are launching for on their professional careers. Such a condition reflects itself in yearly variations of lecture and laboratory programs, particularly lecture, creating as a result many academic problems.

To become specific in taking up the problems created by the necessity of keeping the course work abreast, or ahead of the times, it would appear that in the revival of professional pharmacy the teachers of dispensing have a great opportunity to speed up its return provided they rearrange their lecture work where necessary with that aim in view. The hue and cry of criticism directed against modern pharmacy education is that it is not practical, that the emphasis has been placed in the wrong spots. In many instances this has been correct. The curricula were not designed for the present-day merchandising problems of the average druggist. The commercial or economic problems which he faces were not adequately treated in school. To a certain extent this educational condition has been altered. The pendulum is now swinging toward professional pharmacy. Still our curricula are not altogether adequate even though they are more satisfactory than for instruction in merchandising problems. The situation in professional pharmacy to-day demands a different training than was given yesterday. Conditions incident to the conducting of a successful prescription store are considerably altered. There are new influences and tendencies to be combated, new habits to be built up and old habits to be more vigorously cultivated. In short, we must begin to pay more attention to things other than the means of actually compounding the prescription.

We must pay infinitely more attention to the factors which build up and maintain the prescription business. We must also train the student to become an educator of the physician and the public. He must have inculcated into him before graduation the fact that "pharmacists have responsibilities of service and also duties which include making the public acquainted with pharmacy, its mission, and its part in the life of the state and nation." We must, more than ever, sell the idea that Pharmacy is an ethical profession whose members should hold positions of dignity, responsibility and influence in their communities. Nowhere in the pharmacy work should it be easier to do this than while the student is learning how to aid in maintaining the health and well-being of his neighborhood through proper compounding of their prescriptions.

The relationship of the pharmacist with his physician should have a position of prominence in the didactic work. There should be developed in the student a deep appreciation of the value of this contact. Pharmacy is losing because the physician is visited more regularly by representatives of large business concerns than by his immediate pharmaceutical associates. These paid representatives approach them in a more intelligent manner. They are trained to get certain results and they do. By devoting sufficient time in our prescription courses to the visitation of doctors, in short, by conducting a school of detailsmanship, we could make our students equal, if not superior, in influence to the men whose contact with the physician is only passing.

The dentist should not be neglected in this work. Here is a field of great potentialities, which is as yet almost untouched. The pharmacist has things of value to offer the dental surgeon, and an ethical relationship between the two professions could be made mutually pleasant and profitable. In New Jersey the dental associations are now being made acquainted with pharmacy in a most satisfactory manner. This has come about largely through the efforts of one man. Concerted faculty action in the dispensing courses of our colleges can do much to nationalize this local feeling of understanding and coöperation between the two professions.

A logical outgrowth of the visitation course work is the introduction of a student into the field of service whereby he can develop and enlarge his prescription department so that he has something of merit to present each time he calls on the doctors. The ways in which professional aid can be rendered should be emphasized. We, perhaps, should teach in dispensing the elements of prescription department salesmanship and management, rather than stress so much in other courses how to dress a toilet-goods window. If the life of the profession is to depend on the future development of prescription pharmacy, let us teach it in a business way where possible.

From this work we can lead the student to a realization of the need for the other types of knowledge which he has gotten in school. He can more easily grasp applications of certain information from other courses in the expansion of his prescription department, in the scientific solution of his prescription problems and in his physician and customer contacts. He can be sold on the idea of making use of all the scientific tools at his command to promote the professional end of his business.

As the application of collegiate knowledge becomes clear it is but a step to the demonstration of the value and necessity of continued study after the class room has closed its doors. The student is more receptive to the fact that mental stagnation after graduation means professional failure. One of the worth-while results of this instruction should be the building up of a small library of scientific books and trade journals in a great number of stores.

Just as the lecture work can show the need for and application of other types of knowledge, so can it demonstrate the active necessity for a coöperative participation in the various professional societies and associations. It is particularly difficult to convince a student, or the average druggist for that matter, of the value of such memberships unless there has been considerable diplomatic preparatory work done. Build up in the unsuspecting mind a house that needs just one more stone for

completion; then the acceptance of facts pertaining to the worth of association memberships is relatively easy to bring about. That is why, perhaps, this subject could well be left alone as a central topic for lecture until a clear conception of various other working factors in the carrying on of a successful prescription business are reached.

The undercurrent of ideas throughout all the instruction should proclaim the professional and scientific standing of pharmacy. It should impress the embryo druggist with the fact that he has no reason for the inferiority complex so many of his older brethren assume. He should be convinced beyond doubt that he is the equal in intelligence and ability of his medical friends, and that he knows enough to be a great help to them in their prescription and diagnostic problems.

The entire structure of lecture work should be designed to build up in the student's mind a sense of the vast possibilities of a professional business. Only then will he begin to feel the vital importance of meaning of the prescription to all concerned with it. At that time, instead of wishing he could throw this department out of his store he will become busily engaged in planning for its future, and doing so with a greatly enlarged vision.

Professional pride and a sense of potential position sprouts, grows and flourishes if properly nurtured during undergraduate days. These states of mind are among the greatest stimuli known for the production of perfection in any line of human endeavor. Therefore, if we can instil them into the student of dispensing we will have gone far toward the goal of a publicly recognized and respected professional pharmacy.

AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

THIRTY-THIRD ANNUAL MEETING.

Officers: *President*, Townes R. Leigh; *Vice-President*, Edward D. Davy; *Chairman of Executive Committee*, Charles B. Jordan; *Secretary-Treasurer*, Zada M. Cooper.

Monday, August 22nd.

9:00 A.M. Meeting of Executive Committee.
9:30 A.M. Meeting of Teachers' Conferences.
Pharmacy, Elmer L. Hammond, *Chairman.*
Chemistry, John C. Bauer, *Chairman.*
Materia Medica, Franklin J. Bacon, *Chairman.*
Pharmaceutical Economics, Howard C. Newton, *Chairman.*

CONFERENCE OF TEACHERS OF PHARMACY.

Officers: *Chairman*, Elmer L. Hammond; *Vice-Chairman*, Charles H. Stocking; *Secretary*, Louis W. Rising.

PROGRAM.

"A Method for Teaching Prescription Pricing to College Students," A. O. Mickelsen.
"The Teaching of Pharmaceutical Latin," M. A. Starkman.
"The Deadwood in Laboratory Teaching," Roland T. Lakey.
"The Negro in Pharmacy," J. J. Mullowney.
"A Course in Organic Pharmacy," Antoine E. Greene.
"Some Facts as Brought Out by a Study of the Actual Prices Charged for Prescriptions from Various Parts of the country," Leon Monell.
"The Teaching of Dispensing Pharmacy," G. A. Burbidge.

"Arithmetical Ability as Shown by Placement Tests," R. H. Raabe.
"Contemporary Pharmacy and the Student," Robert W. Rodman.

CONFERENCE OF TEACHERS OF CHEMISTRY.

Officers: *Chairman*, John C. Bauer; *Secretary*, Perry A. Foote. (Program to be supplied.)

CONFERENCE OF TEACHERS OF MATERIA MEDICA.

Officers: *Chairman*, Franklin J. Bacon; *Secretary*, B. V. Christensen.

PROGRAM.

"The Importance of Experimental Pharmacology and Its Possibilities in the Pharmaceutical Curriculum," M. R. Thompson.
"The Teaching of Botany," H. B. Sifton.
"Scope and Methods of Laboratory Teaching in Pharmacognosy," Ralph D. Bienfang.
"Application of Living Plants in the Teaching of Pharmacognosy," Leroy D. Edwards.

CONFERENCE OF TEACHERS OF PHARMACEUTICAL ECONOMICS.

Officers: *Chairman*, Howard C. Newton; *Secretary*, W. Bruce Philip. (Program to be supplied.)

Monday, August 22nd, 1:30 P.M.

First Session of Association.

Roll Call.
Memorial to Dean John R. Minehart, Frank H. Eby.
Appointment of Committee on Resolutions.
Address of the President, Townes R. Leigh.
Report of the Secretary-Treasurer, Zada M. Cooper.
Report of the Executive Committee, Charles B. Jordan.
Report of the Sub-Committee on Bulletins.
Paper—"Examination for the Fairchild Scholarship," C. C. Glover.
Paper—"Should a Pharmacist Speak English?" Alice E. Garvin.
Appointment of Nominating and Auditing Committees.

Reports of Standing Committees:

Committee on Higher Educational Standards, Clair A. Dye.
Committee on Curriculum and Teaching Methods, Wortley F. Rudd.
Committee on Activities of Students and Alumni, C. Leonard O'Connell.
Delegates to the American Council on Education, Rufus A. Lyman.
Committee on Relation of Boards and Colleges, Edward Spease.
Syllabus Committee, J. G. Beard.

Monday, August 22nd, 6:00 P.M.

Annual Dinner.
Address, Honorable W. G. Martin, Minister of Public Welfare of the Province of Ontario.

Tuesday, August 23rd, 1:30 P.M.

Second Session of Association.

Report of Special Committees:

Committee on Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, B. V. Christensen.
Committee on Establishment of a Pharmaceutical Corps in the United States Army, A. Richard Bliss, Jr.
Committee on the Study of Pharmacy, Charles B. Jordan.
Committee on the Council on Pharmaceutical Education, A. G. DuMez.
Committee on Membership Standards, Ernest Little.
Committee on Methods for Interesting Philanthropists in Pharmaceutical Education and Research, Theodore J. Bradley.

Reports of Special Representatives:

Representative to Drug Trade Bureau of Public Information, E. Fullerton Cook.
Reporter on Biological Abstracts, Heber W. Youngken.
Representative to National Conference on Pharmaceutical Research, Glenn L. Jenkins.
Representative to the Druggists' Research Bureau, Paul C. Olsen.
Representative to the National Research Conference, Wortley F. Rudd.
Representative to the Committee on Simplified Practice, Louis F. Bradley.
Representative to the National Association of Retail Druggists, Esten P. Stout.
Historian, Edward Kremers.
Representative to Committee on Centennial Celebration, Wm. B. Day.
Representative on National Drug Store Survey Committee, Charles E. Caspari.
Representative to the Meeting of Drug Store Survey at St. Louis, A. F. Schlichting.
Representative to Dedication of Buildings at Meharry Medical College, A. Richard Bliss, Jr.

Unfinished Business.
Miscellaneous Business.
Election of Officers.
New Business.
Executive Session.

JOINT SESSION OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY AND THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

Tuesday, August 23rd, 9:00 A.M.

Report of Fairchild Scholarship Committee, E. G. Eberle.
Paper—"The Examination for Fairchild Scholarship," C. C. Glover.
Paper—"A Plan for Attaining the Exclusive Use of the Metric System in Pharmacy through the Coöperation of Medical Schools and Manufacturers of Medicinal and Chemical Products," R. L. Greene.
Report of Committee on the Study of Pharmacy, L. L. Walton.
Paper—"District Meetings," Edward Spease.
Discussed by H. C. Christensen.
Paper—"The Method of Registering Pharmacists in the United States," H. C. Christensen.
Paper—"The Method of Registering Pharmacists in the Canadian Provinces."

Corrections and additions will be made in Official Program.

THE BRITISH PHARMACOPŒIA OF 1932.

An Editorial of *The Pharmaceutical Journal and Pharmacist* of July 9th[1] says, "The appearance of a new edition of the British Pharmacopœia is an event of Imperial and even of international interest and importance, primarily, of course, to the medical and pharmaceutical professions in all their branches, but also to the public, for whom uniformity in purity and strength of the drugs and medicines supplied to them is literally of vital value."

"As the first edition to be issued under the operation of a Pharmacopœia Commission, upon which there are represented all the leading interests concerned professionally or otherwise with the production of a really comprehensive, scientific and technical official work of reference for the drugs and medicines included in it, the Pharmacopœia of 1932 naturally challenges comparison with its predecessors, and more particularly with that of 1914."

[1] An extensive résumé is given in that issue, and reference will be made in a succeeding number of THIS JOURNAL.

Attractive rates and routes to Toronto may be had from your R. R. agent—see him promptly.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1931–1932.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 13.

June 30, 1932.

To the Members of the Council:

92. Headquarters Building. Motion No. 32 (see Council Letter No. 11, page 514) has been carried and the contract with the George A. Fuller Company for the erection of the building has been signed by the president, secretary and treasurer of the ASSOCIATION and by the proper officials of the Company.

Senate Joint Resolution No. 50 was passed by the House of Representatives on May 9, 1932, without amendment and was later signed by President Hoover. It has been printed as Public Resolution No. 18 and is as follows:

"Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Commissioners of the District of Columbia are hereby authorized to close upper Water Street, between Twenty-Second and Twenty-Third Streets, northwest, lying north of Potomac Park and south of square 62:

"Provided, That the consent in writing of the owners of three-fourths of all private property on the south side of square 62 is first had and obtained; and upon the closing of said street between the limits named the Commissioners of the District of Columbia are authorized to transfer the land contained in the bed of said street to the Director of Public Buildings and Public Parks of the National Capital, as part of the park system of the District of Columbia: Provided further, That the said commissioners be, and they are hereby, authorized to enter upon said closed area at all times for the purpose of maintenance and repair of all existing sewers and sewer appurtenances.

"Sec. 2. The Director of Public Buildings and Public Parks of the National Capital is authorized to transfer to the AMERICAN PHARMACEUTICAL ASSOCIATION such an area adjacent to the land owned by the said ASSOCIATION, as shall be agreed upon between the ASSOCIATION and the two commissions hereinafter named, so that the location and the setting of the ASSOCIATION's building will conform to the plan prepared by the National Capital Park and Planning Commission and approved by the National Commission of Fine Arts for the treatment of that area, and in the construction of said building the said ASSOCIATION shall take such steps as are necessary to insure the safety of existing sewers and sewer appurtenances: Provided, That the AMERICAN PHARMACEUTICAL ASSOCIATION agrees, contemporaneously with the above transfer to it, to transfer to the United States of America title to a strip of land owned by said ASSOCIATION seventeen feet in depth along Twenty-Third Street, for the purpose of widening said street as an approach to the Lincoln Memorial: Provided further, That the design of the said ASSOCIATION's building shall be such as to be approved by the National Commission of Fine Arts, and its use shall be limited to organizations and institutions serving American pharmacy on a nonprofit basis."

Certified copies of the Joint Resolution were promptly filed with the Commissioners of the District of Columbia together with the required application for the closing of Water Street between Twenty-Second and Twenty-Third Streets, N. W. Following the closing of the street and the formal transfer of the property to the Director of Public Buildings and Public Parks, the ASSOCIATION can proceed to accept title for the property to be transferred to it by the Government and in turn to deed seventeen feet along the west side of its property to the Government for the purpose of widening Twenty-Third Street as an approach to the Lincoln Memorial.

The National Capital Park and Planning Commission and the Commission of Fine Arts have approved the location of our building in accordance with a plan prepared by Architect Pope and which places the building somewhat in advance of the line of the Academy of Sciences.

Architect Pope is now preparing a plan of the landscape treatment of the site for consideration by the commissions named above.

When this plan is approved and the transfer of property completed, building operations can be begun promptly.

93. American Council on Pharmaceutical Education. As no comments have been submitted by members of the Council, a vote is called for on Motion No. 33. (See Council Letter No. 12, page 604.)

94. Use of the Text of the N. F. V. Dr. Beal has expressed the opinion that as a matter of association courtesy no charge should be made to the N. A. R. D. for the use of the text of the N. F. V as outlined under item No. 90, and Motion No. 34. (See Council Letter No. 12, page 604.)

Dr. Beal writes "I object to charging the N. A. R. D. anything for its use of the text. The N. A. R. D is proposing to advertise the National Formulary for us at its own expense, and we should be grateful to that association for its offer to render us this service."

(*Motion No. 36*) *It is moved by Beal that Motion No. 34 be amended by striking out the words "and at the usual charge of $5.00" and inserting in lieu thereof the words "without charge upon condition that there be placed upon the reverse of the title page of the booklet the usual acknowledgment."*

95. Election of Members. Motion No. 35 (see Council Letter No. 12, page 604) has been carried and applicants numbered 283 to 295 are declared elected.

96. Life Membership. Mr. Edward Nathan Webb, Worthington, Ohio, has become a Life Member through the payment of $25.00.

Dr. J. Leon Lascoff annually offers as a prize in the College of Pharmacy, Columbia University, a Life Membership in the A. PH. A. This year the prize has been awarded to Harry L. Handsman, and Dr. Lascoff has forwarded his check for $100.

L. M. No. 1. Harry L. Handsman, 564 Linden Boulevard, Brooklyn, N. Y.

(*Motion No. 37*) *Vote on Application for Life Membership.*

97. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 296, Allen Bell, Shelton, Wash.; No. 297, Rudolph H. Blythe, Roxbury, N. Y.; No. 298, Peter O. Bugge, Bisbee, N. Dak.; No. 299, William Cantelupe, 1246 Haywood St., Farrell, Pa.; No. 300, Gay Clark, 323 N. Hill St., Morristown, Tenn.; No. 301, Charles G. Danielian, 893 Broadway, Chelsea, Mass.; No. 302, Harvey Denton, St. John, Wash.; No. 303, Gabriel DiLeonardo, 44 Carver St., Pittsburgh, Pa.; No. 304, Charles B. Dunnington, 53 Augusta Ave., Brockton, Mass.; No. 305, Winyard Fraidenburg, Castle Rock, Wash.; No. 306, Jos. E. Haney, 5231 Hohman Ave., Hammond, Ind.; No. 307, Catherine H. Idzikowska, 155 Boston St., Dorchester, Mass.; No. 308, Leonard Sterling Jones, 333 Locust St., Hampton, Va.; No. 309, Paul Lutton, 115 West Sumach St., Walla Walla, Wash.; No. 310, Rush D. McKean, c/o School of Pharmacy, State University of Iowa, Iowa City, Iowa; No. 311, Rudolph F. Pierce, 1629 Ridge Ave., North Braddock, Pa.; No. 312, Herbert C. Raubenheimer, 1223 Pacific St., Brooklyn, N. Y.; No. 313, Mitchell Stoklosa, 318 High St., Lowell, Mass.; No. 314, Anthony Frank Valerio, 355 Atkins Ave., Brooklyn, N. Y.; No. 315, Hyman R. Westerman, 376 Ferry St., Malden, Mass.

(*Motion No. 38*) *Vote on applications for membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*

JAPANESE SOCIETY BANQUET.

A banquet was held, attended by Dr. Toyokichi Takahashi, an authority in Japan's chemical industry and who was recently decorated by the British Chemical Society, as well as by Kiroku Oguchi, M.P. In the course of the banquet, speeches were delivered by prominent persons, including the above-mentioned, and Dr. Kametaro Kawai.

It was decided to hold next year's general meeting at Mukden, Manchuria, at the suggestion of the Pharmaceutical Society of Manchuria.

As usual, the meeting of hygienic experts was held prior to the meeting of the Japan Pharmaceutical Society, in the Pharmacy Hall in the Imperial University of Tokyo, and was attended by 68 health officers who had come to the Capital from all parts of the country. The meeting was opened by Dr. Keizo Ikeguchi.

This was followed by the first meeting of the Japan Hygienic Chemical Society.

A meeting of the head pharmacists of hospitals was also held in the Pharmacy Hall of the Imperial University simultaneously with the conference of the hygienic experts. It was presided over by Pharmacist-General Isono.

CORRESPONDENCE

PHARMACY DEVELOPMENT IN WEST CHINA.

BY E. N. MEUSER.*

"The writer, as a pharmacist missionary in West China since 1909, has just recently returned to the work here after an extended furlough of approximately seven years in the United States and Canada.

For several years prior to my leaving China for furlough in 1925, I was engaged in developing professional pharmacy in this country along two particular lines, *viz.*, the training of Chinese students in pharmacy, and research in Chinese crude drugs. Both the school of pharmacy and the research department gave promise of considerable encouragement to me.

Owing to disturbed political conditions in the country, and my long absence from the work here, the school has been discontinued and little or no constructive work in drug research has been carried on for some years. However, since my return, and with greatly improved political conditions throughout West China, a general reorganization of pharmacy has taken place. A Department of Pharmacy has been established in connection with the College of Science of the West China Union University, for the purpose of training Chinese pharmacists. Research in Chinese crude drugs is also being undertaken on a much more extensive scale than was previously possible.

There is a very marked interest shown by the Chinese in both of these projects, and, on the whole, the future prospects for the development of pharmacy in China are more encouraging now than they have ever been before.

The population of West China is about 100,000,000, and this is the only organized Course in pharmacy instruction given in West and Central China. Moreover, I am of the opinion that it is the only University Course in pharmacy in all China with its vast population of over 400,000,000. The possibilities and opportunities are, therefore, both tremendous and unique.

It is estimated that seventy-five per cent of all the native drugs used in China are produced in Western China. Large numbers of students are interested in the study of pharmacy, partly because of the latest possibilities in these crude drugs and, in general, because of the attractive opportunities open to qualified pharmacists throughout the country.

In establishing a department of pharmacy here, it is my desire to have as thorough a course of instruction given as possible in pharmacy and its allied subjects. I find myself rather seriously handicapped in some directions, however, for lack of equipment, finances, etc., and for this reason I am writing to solicit the coöperation and assistance of our Western friends, such as manufacturing, wholesale and retail pharmacists, schools and colleges of pharmacy, pharmaceutical associations, and business and professional people generally. I am of the opinion that there are many friends of pharmacy in the United States, Canada, England, etc., who might be willing and glad to coöperate with us here if they knew our needs. I am, therefore, suggesting the following items as the more important of our needs in connection with the development of pharmacy in West China:

1. Pharmacal Laboratory: General equipment of apparatus and chemicals for teaching purposes.

2. Pharmacy Library: (*a*) Reference books, etc., on pharmacy and allied subjects; (*b*) sample copies, at least, of each and every pharmaceutical journal published in the United States, Canada and England, and, if possible, other countries also; (*c*) Regular monthly copies of pharmaceutical journals.

3. Sample apparatus and machinery for the manufacture of pharmaceuticals.

4. Scholarships and awards for pharmacy students in a University Course of four years, leading to the degree of Bachelor of Science in Pharmacy.

5. Sample sets of pharmaceutical, biological and other products of individual manufacturing and distributing firms, for general display and for exhibition in teaching. For a Course in "Pharmacal Sundries" we will be able to demonstrate a considerable variety of such articles.

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* Head of Department of Pharmacy, West China Union University, Chengtu, Szechuan West China.

In all cases, due mention will be made in the Annual Catalog of all those coöperating in any way, unless this is specifically not desired.

I might just add here also, that China is a splendid open market for western pharmaceutical products, and, in my opinion, any advertising done now through any of the above suggested means will be a valuable asset to the advertiser for possible future business, of mutual benefit to all concerned. Anything done in the nature of coöperation, even apart from the thought of advertising, will tend very materially toward welding a much-desired spirit of international good-will and friendship.

I would suggest that, so far as possible in case of goods being sent to us, parcels be sent by mail as *registered parcel post* direct to me, as the quickest method for even larger parcels. Otherwise, that goods be sent by freight addressed to—E. N. Meuser, W. C. U. U., Chengtu, W. China, c/o Can. Miss. Bus. Agency, Chungking, Szechuan, West China."

MISUSE OF WORD "DRUG."*

News writers and headline writers often refer to "drug addicts," "drug fiends" and "drug raids," when they mean "narcotic (or dope) addicts," "narcotic fiends" and "narcotic raids."

Some "dope fiend" runs amuck, the police raid an opium den or arrest an opium peddler, some one gets into trouble by selling opium or other narcotics, and the event is likely chronicled as the misadventure of a "drug peddler," when "dope peddler" or "narcotic peddler" is meant.

A drug is defined in the National Food and Drugs Act, as an article used for the purpose of curing, mitigating or preventing disease in man or other animal. Drugs are handled by over 60,000 retail druggists, who play a most important part in the health and economy of the people; by over 500 wholesale druggists; by several hundred manufacturing druggists—all of whom are by inference harmed when the word "drug" is used to designate that particular class of drugs known as "narcotics" or "dope."

No objection could possibly be had to the publication of the misdeeds or misadventures of "dope peddlers" or "dope addicts" but to describe them as "drug peddlers" or "drug addicts" does an injury.

Can't you—and won't you—try to right this inadvertent wrong by asking men who write news or headlines to differentiate between "drug" and "narcotic" or "dope?"

Dr. C. W. Ballard has been appointed professor of Materia Medica in the College of Pharmacy, Columbia University, following the resignation of **Dr. H. H. Rusby** as *Professor Emeritus*. Dr. Rusby will continue certain of his teaching duties in the College but this action accords with his desire for a greater amount of time to be devoted to research and literary pursuits. Dr. Ballard has been associated with Dr. Rusby for the past twenty-five years, serving the College as instructor and associate professor. He has received degrees Ph.Ch. and Phar.D. in the College of Pharmacy, M.A. and Ph.D. from the Faculty of Applied Science of the University, and has pursued medical studies at College of Physicians and Surgeons, Columbia University and School of Medicine, Fordham University. For several years he has been microanalyst to the Bureau of Foods and Drugs, Health Department, New York City.

Texas pharmacists prepared a unique and beautiful "Adams Scrap Book" commemorating "Adams Day," at which time friends expressed their esteem and appreciation of their friend and co-worker.

SCIENCE CONGRESS.

The 21st meeting of the Australian and New Zealand Association for the Advancement of Science will be held in Sydney during the week commencing August 17, 1932. Mr. H. Finnemore has been nominated as President of Section 0 (Pharmaceutical Science), and Mr. L. J. Thompson has consented to carry out the secretarial duties. Now that the date of the Science Congress meeting has been fixed an early commencement will be made regarding the meeting of the Australasian Pharmaceutical Conference, which is held annually during the week prior to the Science Association meeting. It is hoped that there will be a large and representative attendance at the 1932 meeting. Pharmacists who are contemplating a visit to Sydney about the time mentioned and are desirous of attending these meetings can obtain further particulars on application to the Secretary of the Pharmaceutical Society in their state.

* Approved by Executive of National Drug Trade Conference.

EDITORIAL NOTES

Editor: E. G. Eberle, 10 West Chase Street, Baltimore, Md.

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LET US ASSIST YOU IN SOLVING PRESCRIPTION PROBLEMS.

Dr. S. L. Hilton, former President of the A. PH. A. and Chairman of its Council, well and favorably known pharmacist of Washington, will answer problems that come up in prescription practice. We, therefore, invite those who have problems to send them to this office at 10 W. Chase St.

CENTURY OF "ANNALEN DER PHARMACIE."

At the age of fifteen, Justus Liebig, later Baron Justus von Liebig, was apprenticed to an apothecary in Pappenheim. His "Handbuch der Organischen Chemie" is part of Geiger's "Handbuch der Pharmazie" (1839). Friedrich Wöhler was Liebig's friend and coworker, and associated with him in many researches. Prof. Otto Raubenheimer contributed an historical article to the Section on Historical Pharmacy, A. PH. A., on "Friedrich Wöhler and the Centenary of Synthesis" at the Portland meeting, 1928.

Professor Hofman wrote in his biography of Wöhler: "The present generation, which is constantly gathering such rich harvests from the territory won for it by Wöhler, can only with difficulty transport itself back to that remote period which the creation of an organic compound within the body of an animal or plant appeared to be conditioned in some mysterious way by the vital force, and they can hardly realize the impression which the building up of urea from its elements made on men's minds." (Liebig and Wöhler are shown in a picture on page 559 of the JOURNAL for 1923, taken from a photograph belonging to the late Albert E. Ebert. Liebig's "Annalen der Chemie" is a continuation of "Annalen der Pharmacie"—established in 1832 under the editorship of R. Brandes, Ph. L. Geiger and Justus von Liebig—later, Annalen der Chemie und Pharmacie (now consists of 500 volumes, including supplementaries). We quote *Chemistry and Industry* of June 3rd (*Journal of the Society of Chemical Industry—British*).

"In 1832 pharmacy was to the fore, chemistry but its servant: this fact is too often forgotten, in the even-recurring use of the term (Great Britain) chemist: historically chemistry and pharmacy are inseparables: diverging, as they have been, perhaps, during the past century, the two disciplines are now once more coming together, as we are fast being compelled to see that we are beyond all control drug addicts by nature." Other publications may give thought to Willstätter's statement "Es ist notwending, in den rasch herankommenden Berichten zu publizieren; in der 'annalen' zu erscheinen ist eine Ehre."

Professor Willstätter has recently written a number of personal sketches of scientists whose work has given us vast powers and information. *Chemistry and Industry* says editorially—"we do not sufficiently seek to understand and praise the great men who have given us the vast powers we now yield;" and the same publication in closing its editorial congratulates the *Annalen* in these words: "We congratulate our contemporary upon the greatness of its past and wish for it a still greater future, if indeed this be possible."

THE BRITISH PHARMACEUTICAL SOCIETY.

Every person registered as chemist and druggist within the meaning of the British Pharmacy Act of 1868 is entitled to apply for admission as member of the British Pharmaceutical Society, the headquarters of which is at 17 Bloomsbury Square, London. All members are supplied with the *Pharmaceutical Journal* free of charge. The members have access to the Library, and are eligible for nomination as candidates for election to the Council. Student associates are entitled to compete for the Jacob Bell Memorial Scholarship and other prizes. By virtue of their connection with the Society, members and student associates are members of the Branch of the Society in their locality and are thus brought into contact with their confrères, both for social events and for discussion of matters affecting their professional interest.

The Society founded a school of pharmacy in 1842 and has continued it since that time. The activities of the Society are under the direction of the Council.

The British Pharmaceutical Conference gives attention to the professional side. The chairmen prepare addresses according to somewhat different lines from those of the presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION.—A single subject is usually chosen by the chairman; last year the subject of Chairman J. H. Franklin was "Manchester Men of Science."

The papers presented before the Conference are similar to those of the Scientific and Practical Pharmacy and Dispensing sections of the A. PH. A.

VISITORS FROM GREAT BRITAIN.

The following members of the Pharmaceutical Society of Great Britain will attend the CANADIAN—AMERICAN PHARMACEUTICAL Convention in Toronto.

F. GLADSTONE HINES, PRESIDENT OF THE SOCIETY.

F. Gladstone Hines, the newly elected president of the Pharmaceutical Society of Great Britain, passed the qualifying examination in 1902, and after a brief experience with a manufacturing firm went into retail business on his own account. He has served continuously as a member of the Society's Council since 1917, putting in also a good deal of work in other spheres of pharmacy and in political life. Mr. Hines still has extensive retail interests, and is a director of Grimwade, Ridley & Co. (Ipswich), Ltd., a wholesale and manufacturing house. Since 1930 he has been vice-president of the Pharmaceutical Society, and there stands to his credit a fruitful record of service to pharmacy as a member of Council. In that

F. GLADSTONE HINES.

capacity he has done much valuable work on the Education, Finance, Publications and Law Committees; as a speaker and debater at Council meetings and as an active and effective platform exponent of the work and policy of the Council.

HERBERT SKINNER, CHAIRMAN OF THE CONFERENCE.

Herbert Skinner was elected a member of the Council of the Pharmaceutical Society of Great Britain in 1916. He was vice-president in 1926–1927 and president in 1927–1929. He is to be chairman of the British Pharmaceutical Conference at its meeting in September of

HERBERT SKINNER.

this year at Aberdeen. He is chief pharmacist at the Royal Northern Hospital, London.

Our correspondent states that he has served a long apprenticeship and training in pharmaceutical public life and as a leader in Metropolitan pharmacy before he entered the Council in 1916. Throughout his member-

ship of the Council Mr. Skinner has served conscientiously and capably on its various Standing Committees, and as chairman of the *Journal* Committee he has done much important and valuable work, notably in connection with the arrangements for the publication and circulation of such standard works as the British Pharmaceutical Codex, the Year Book of Pharmacy and the new, revised and enlarged edition of the Pharmaceutical Pocket Book. Few members of Council have overtaken so much platform work on behalf of the Society, or have devoted themselves more strenuously to the practical promotion of the Society's interests.

HUGH N. LINSTEAD, SECRETARY OF THE PHARMACEUTICAL SOCIETY.

Secretary Hugh Nicholas Linstead, of the British Pharmaceutical Society, is a Pharmaceutical Chemist and Barrister-at-Law. After

HUGH N. LINSTEAD.

serving as assistant secretary of the Pharmaceutical Society under the late Sir William Glyn-Jones he was appointed Secretary and Registrar in 1926.

THOMAS MARNS.

THOMAS MARNS, MEMBER OF COUNCIL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

Thomas Marns gained medals in pharmacy and qualified in 1910. He was for a number of years a branch manager of Messrs. Boots, and in 1915 acquired a business of his own in Ealing. Early in 1925 he was elected to the Retail Section of the Proprietary Articles Trade Association, founded in 1897, by the late Sir W. S. Glyn-Jones, in the activities and objects of which he takes a deep interest. He is vice-chairman of the Middlesex Pharmaceutical Committee, and a leading member of the virile Ealing and District Pharmacists' Association, of which he is a former president. He is a member of the Council and chairman of the Law Committee. He controls a number of retail pharmacies in London.

AMERICAN PHARMACEUTICAL ASSOCIATION MEMBERSHIP PRIZES.

UNIVERSITY OF ILLINOIS PRIZES.

The JOURNAL OF THE A. PH. A. at 10 W. Chase St., Baltimore, will be pleased to receive information regarding awards made by Pharmacy Schools and individuals, awards of membership or life memberships in the A. PH. A.

The Scherer Prize for excellence in pharmacy was awarded by Andrew Scherer to David Nathanson of Chicago.

The Mrazek Prize in Chemistry was awarded by Leo L. Mrazek to Frank Bernard Drexel of Chicago.

The Pedigo Materia Medica Prize awarded by Lee M. Pedigo to Joseph Edward Lohr of Cicero, Illinois.

The Hotel-Saltiel-Hodel Prize for general scholarship awarded by Emil and Oscar Hodel and Henry Saltiel to Boris Golden of Chicago.

The William Gray Prize for excellence in dispensing awarded by William Gray to Henry S. Kepher of Chicago.

The S. L. Antonow Prize for general scholarship awarded to Miss Blossom Kohn of Chicago.

The Alice Pelikan Prize in Materia Medica awarded by Mrs. Alice Pelikan to Joseph J. Cech of Hollywood, Ill.

PARAFFIN AND AGAR EMULSION.

A paraffin and agar-agar emulsion of the type generally in demand can be prepared as follows:

Agar-agar	1 Gm.
Water	70 cc.
Liquid paraffin	130 Gm.

Take a dry, wide-mouthed bottle capable of holding twice this volume; weigh into it half the quantity of liquid paraffin and shake; place the remainder of the liquid paraffin ready to hand. Boil the agar-agar with half the water for fifteen minutes, strain and add the other half of the cold water, boil and strain. Cool to 70° C., add to the liquid paraffin in the bottle and shake violently till the paraffin is finely divided. Add the remainder of the paraffin in three portions, shaking very vigorously after each addition; then shake gently till cool.—J. Elsenburg (*Pharm. Weekblad*, Vol. 69, 300).

STERILIZATION IN THE NEW SWISS PHARMACOPŒIA.

The new Swiss Pharmacopœia defines the following methods for obtaining sterile solutions:

(*a*) Flaming.

(*b*) Dry heat at 160° C. for one and one-half hours.

(*c*) Dry heat at 120° C. for two hours.

(*d*) Boiling for twenty minutes, either using a reflux condenser or replacing the evaporated water by sterile water.

(*e*) Boiling in water for twenty to thirty minutes, adding, in the case of metal instruments, 1–2 per cent of sodium carbonate or of borax.

(*f*) Heating in a steam sterilizer at about 100° C. for thirty minutes.

(*g*) Heating in an autoclave at 110–120° C. for fifteen or twenty minutes.

(*h*) Tyndallization at 60–65° C. for an hour on three successive days.

(*i*) Preparation under aseptic conditions; in these circumstances the preparations are designated approximately sterile (paene sterilisatum).—From *Pharm. Jour. and Pharm.* 4/16/32.

PERSONAL AND NEWS ITEMS.

The *British Medical Journal*, London, contains the announcement, "that at a meeting of the Council of the Royal College of Surgeons of England, Lord Moynihan, president, in the chair, The Right Hon. Lord Dawson of Penn, P.C., G.C., V.O., K.C.B., K.C.M.G., Physician to His Majesty the King, and president of the Royal College of Physicians of London, and Sir Henry Wellcome, LL.D., F.S.A., founder of The Wellcome Research Institution, were elected Honorary Fellows of the Royal College of Surgeons.

The Royal College of Surgeons of England is one of the most exclusive scientific bodies in England, and the bestowal of this honor on Sir Henry Wellcome is very exceptional in that aside from members of the Royal Family, Sir Henry is the second person not holding a medical degree upon whom this rare distinction has been conferred, the first and only other recipient being the famous Field Marshall, Lord Roberts of Kandahar.

Sir Henry Wellcome is of American birth and is well known for his world-wide scientific work and extensive pioneer researches in connection with tropical diseases, including the founding of The Wellcome Tropical Research Laboratories at Khartoum on the Upper Nile Regions of the Sudan, Africa. He is also a Director of the Gorgas Memorial Institute, Washington, D. C., with its Tropical Research Laboratories at Panama."

Prof. Alex B. J. Moore has retired from the McGill University Department of Pharmacy, after a service of fifty-five years. It is hoped that he will attend the Toronto convention.

The Medal of the American Institute of Chemists for 1932 was awarded to Dr. Charles H. Herty. *The Chemist* for June features the occasion and is illustrated by group pictures and that of individuals who took part in the ceremony. The medal also is shown. Among the speakers were Dr. F. E. Breithut, Dr. Marston T. Bogert, Dr. Henry W. Jessup, Dr. John H. Finley, former Congressman, Joseph E. Ransdell, and Francis P. Garvan.

Mathias Noll, historian of Kansas Pharmaceutical Association, writes that the history he prepared and referred to in a preceding number of the JOURNAL is to be printed and he has promised a copy as a gift to the AMERICAN PHARMACEUTICAL ASSOCIATION.

The Washington Post, of July 2nd, gave an interesting account of the ground-breaking ceremonies and included a group picture. The address of Dr. Charles Moore was featured.

President Harvey A. Henry, on behalf of the California Pharmaceutical Association, extended hearty congratulations on the important event of ground breaking for the new home of the American Institute of Pharmacy and appointed Mr. and Mrs. W. Bruce Philip as delegates to represent the California association.

P. V. Keating, of Dallas, Texas, sent the following telegram to President Adams:

The eyes of Texas are upon as our hearts are with you and wish you, the AMERICAN PHARMACEUTICAL ASSOCIATION and the American Institute of Pharmacy God speed, good fortune and a well-earned success. Texas asks you to dig deep into the soil of the national capital of the greatest nation in the world a place for the cornerstone of that institute destined to prove a magnificent gift and boon to world mankind.

President Hines, of the British Pharmaceutical Society, and President Adams, A. PH. A., will address the General Session of the Toronto meeting. Dr. H. J. Cody, president-elect of the University of Toronto, will be the principal speaker at the banquet of the CANADIAN—AMERICAN PHARMACEUTICAL Convention, August 22nd—his subject will be "Relations between Canada and the United States."

Louis Montanaro, of New Haven, was named president and **Hugh P. Bierne,** president of the Connecticut Pharmaceutical Association, was elected secretary-treasurer at the annual meeting of the state board of pharmacy.

A drug center and market place to be established in the St. Louis, Mo., Mart Building, will occupy 90,000 square feet in the merchandise and warehouse sections.

Of this space, 50,000 square feet will be in the warehouse division and 40,000 in the merchandise section. Ten thousand square feet will be devoted to a model drug salon, to be known as Drug Center, which will be under the direction of Alfred W. Pauley, a trustee and former president of the St. Louis College of Pharmacy. Mr. Pauley will be remembered as *Local Secretary*, by those who attended the St. Louis A. PH. A. meeting.

R. E. Lee Williamson made the presentation address of a silver service to Secretary E. F. Kelly at Ocean City, following introductory remarks by **Samuel Y. Harris,** who was *Local Secretary* of the Baltimore A. PH. A. meeting and thereby, contributed largely to its success. Mr. Williamson's address was well received and will be remembered for its descriptive words and beautiful presentation.

Ambrose Hunsberger, Philadelphia, Pa., has been named supervisor of alcohol permits for the third district of the Bureau of Industrial Alcohol, succeeding Samuel O. Wynne, who has retired from the federal service. Mr. Hunsberger is member of the Council A. PH. A.

On July first, Woods A. Caperton, nationally known to the wholesale drug trade, relinquished active connection with Eli Lilly and Company. In 1902, Mr. Caperton entered the sales department of Eli Lilly and Company. His success was so marked that two years later he was placed in charge of the New Orleans branch. In 1906, he was called to Indianapolis and made Assistant Sales Manager, and for many years directed the traveling service of this company.

For two years he was chairman of the Indiana State Tuberculosis Commission, appointed by the Governor to make a survey of the sanitaria maintained at public expense and to recommend a policy for their future extension. In this work he held meetings throughout Indiana to arouse public interest in the care of the tuberculous.

David F. Jones, of Watertown, former president of the AMERICAN PHARMACEUTICAL ASSOCIATION and veteran South Dakota pharmacist, was initiated into the national honor society of Rho Chi during a special ceremonial held at the State College, Brookings, late in May. Mrs. Jones accompanied her husband to Brookings.

On June 20, 1932, the University of Michigan conferred the honorary degree of Master of Science upon our fellow member, **L. E. Warren.** The degree was granted for meritorious contributions to pharmaceutical science. Mr.

L. E. WARREN.

Warren is *Chairman* of the Scientific Section, A. PH. A., this year. He is a former chemist of the American Medical Association and now of the U. S. Department of Agriculture. He was twice awarded the Ebert prize.

Dr. B. V. Christensen, College of Pharmacy, University of Florida, has received appointment as a member of the Committee on Pharmacognosy and Pharmaceutical Botany of the National Research Council. The membership of this committee as now constituted is: Heber W. Youngken, *Chairman*, Massachusetts College of Pharmacy; B. V. Christensen, University of Florida; W. W. Eggleston, U. S. Bureau of Plant Industry; E. N. Gathercoal, University of Illinois; E. L. Newcomb, 51 Maiden Lane, New York; H. H. Rusby, Columbia University; W. W. Stockberger, U. S. Bureau of Plant Industry.

President Walter D. Adams, A. PH. A., presented the Alabama Association with a gavel, expressing the hope that it would be used at its centenary meeting.

Secretary W. E. Bingham was presented by the Alabama Pharmaceutical Association with a beautiful office desk in recognition of his services for the past thirty-one years.

Mr. William Phillip Want, Ph.C., has retired from the editorship of the *British and Colonial Pharmacist* after a fruitful service of over forty years, first as sub-editor, from 1891 to 1901, and then as editor, from 1901, severing his long association with that journal after seeing the December issue to press. Mr. Want was apprenticed in 1881, passed the London Matriculation examination in the following year, and was senior Bell Scholar in 1885. For four years (1887–1891) he was dispenser at the Royal Hospital, Greenwich, under the late Dr. G. W. Armstrong, and then joined the *British and Colonial Druggist*, as it was then called. Mr. Want's successor as editor of the *British and Colonial Pharmacist* is Mr. A. C. Merrin, who has been assistant editor since 1901.

OBITUARY.

DAVID R. MILLARD.

David R. Millard, prominent pharmacist and president of the Baltimore Veteran Druggists' Association, died at Union Memorial Hospital, July 1st, aged 64 years. Death was due to bronchial-pneumonia. Mr. Millard was a native of Goldsboro, N. C., and came to Baltimore in 1894. In 1904 a partnership was established with Charles Morgan, the firm being Morgan and Millard, and their stores are among the best known in Baltimore. He was one of the organizers of the Calvert Drug Co.

His early education was received at Wake Forest College, North Carolina; later, he entered the University of Maryland and graduated from the Department of Pharmacy. He was a former member of the Maryland State Board of Pharmacy and had been its secretary.

Mr. Millard is survived by his widow, a daughter and two sons.

JOHN HAYWOOD HARDIN.

John H. Hardin, veteran pharmacist of Wilmington, North Carolina, and member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1881, died at his home May 30th, aged 79 years. A sketch of the deceased will be found in the February JOURNAL for 1931, page 89. Mr. Hardin moved with his parents to Wilmington, from Washington, the birthplace of the deceased, when he was still in his early teens. He received his academic education in General Colston's Military Academy.

The North Carolina Pharmaceutical Association in recognition of his fifty years of useful service and membership, presented Mr. Hardin with a gold watch. The *Carolina Journal of Pharmacy* for April 1929, was a memorial number in his honor. The local papers speak of him as a valuable citizen and one who has given his support constructively to the up-building of the community. Modest and unassuming he endeared himself to a large circle of friends.

He is survived by his widow and the following children: Mrs. W. A. Dunn, Mrs. Thomas C. Darrst; Susan L., John H., Jr., Eugene B., and Mary B. Hardin.

FRANK E. MORGAN.

Frank E. Morgan, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, and founder of Frank E. Morgan & Son, Apothecaries, 1629 Walnut St., died June 10th at his home in Baederwood, near Jenkintown, aged 80 years.

He was born April 10, 1852, in Concord, N. H., and came to Philadelphia in 1876. He was graduated from the Philadelphia College of Pharmacy and Science in 1881.

Mr. Morgan then opened a drug store at 16th and Race Sts., and later moved to 1410 Walnut St. In 1889, he established the Walnut Street store, well known and favorably known as an

exclusive pharmacy. He is survived by his wife and a son, Frank Jr.

FRANK J. DUBSKY, CHICAGO, ILL., WILLIAM F. BAUM, DANVILLE, ILL.

Secretary William B. Day, of Illinois Pharmaceutical Association and former President of the A. PH. A., has advised us of the death of two former presidents of Illinois Pharmaceutical Association, members of the AMERICAN PHARMACEUTICAL ASSOCIATION—Frank J. Dubsky, of Chicago, president of the Illinois Association, 1918–1919, who died June 20th, and William F. Baum, Danville, president of Illinois Association in 1914–1915, who died July 2nd, aged 84 years. Further notice will be made in a succeeding number of the JOURNAL.

Dr. George K. Burgess, director of the Bureau of Standards, Department of Commerce, since 1923, died of a cerebral hemorrhage July 2nd, aged 57 years. He had been connected with the Bureau since 1903.

Dr. Burgess was a graduate of Massachusetts Institute of Technology and later studied at the University of Paris; returning from the latter he became associated with the Bureau of Standards. He was interested in every field of science in which the outcome was service to American industry. He acquired an international reputation in the field of high temperature measurement and in metallurgy.

James N. Gamble, vice-president of Procter & Gamble and son of one of its founders, died at his home in Cincinnati, July 2nd, aged 95 years. He attended Chickering Institute and Kenyon College and the University of Baltimore. The deceased took a deep interest in a number of charitable and civic promotions.

SOCIETIES AND COLLEGES.

THE SECTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The programs are incomplete and order may be changed before the Convention. Contributors to the Sections should send in titles and abstracts of their papers, if not complete, so they can be entered on the official program. This should be done promptly. Additional numbers and items will have to find place in August JOURNAL. Official Program is now being prepared. For program see May JOURNAL, page 513. For Hotel Rates see April JOURNAL, page 314. For R. R. rates see your agent promptly.

SCIENTIFIC SECTION.

Officers: *Chairman,* L. E. Warren, Bureau of Chemistry, Washington, D. C.; *First Vice-Chairman,* W. J. Husa, U. of Fla., Gainesville, Fla.; *Second Vice-Chairman,* A. R. Bliss, Jr., Room 211P, 874 Union Ave., Memphis, Tenn.; *Secretary,* L. W. Rowe, c/o Parke, Davis & Co., Detroit, Mich.; *Delegate to the House of Delegates,* E. E. Swanson, c/o Eli Lilly & Co., Indianapolis, Ind.

Proper arrangement will be made of all section programs in the Official Program. All sections have had additional papers.

PRELIMINARY LIST OF TITLES FOR THE SCIENTIFIC SECTION, TORONTO MEETING.

"Overcoming Interferences from Volatile Bases in Assay of Mydriatic Drugs," George E. Ewe.

"Common and Destructive Pests," Ernst T. Stuhr.

"An Assay Procedure for Camphorated Tincture of Opium, U. S. P.," A. R. Bliss, Jr., E. D. Davy, R. W. Morrison, N. T. Chamberlin.

"A Comparative Study of Certain Xanthine Diuretics," A. R. Bliss, Jr., and R. W. Morrison.

"The Relation of Vitamin Deficiency to Urinary Calculi Formation in Rats," A. R. Bliss, Jr., and E. O. Prather, Jr.

"The Effect of Various Compounds upon the Stability of Hydriodic Acid," Wm. J. Husa and Louis Magid.

"The Antiseptic Value of Phenol Ointments," Wm. J. Husa and Jeannette M. Radin.

"The Stability of Solution of Iron and Ammonium Acetate, U. S. P. X," Wm. J. Husa and George W. Birmingham.

"The Bactericidal Efficiency and Toxicity of Creosote and Its Components," Louis Gershenfeld, Ralph Pressman and H. C. Wood, Jr.

"Gasometric Estimation of Sodium Nitrite in the Presence of a Bicarbonate and a Nitrate," Lester C. Dick.

"Assay Method for the Determination of an Alkaloid or Total Alkaloids in Coated or Uncoated Tablets," Lester C. Dick.

"Tannin Spot Tests for Drugs," J. Hampton Hoch.

"Studies on Commercial Psyllium Seeds," Heber W. Youngken.

"The Assay of Pepsin and Pepsin Preparations," Glenn L. Jenkins and Edward M. Hoshall.

"A Phytochemical Study of Gillenia Stipulata," Glenn L. Jenkins and L. L. Manchey.

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"The Pharmacologic Activity of Chemically Assayed Spirit of Ethyl Nitrite, Including p_H Values," M. R. Thompson, Marvin J. Andrews and Casimer T. Ichniowski.

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"Chemical Assay of Ma Huang," Alice Hayden and C. B. Jordan.

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"Ammi Visuaga, Its Pharmacognosy, Pharmacology and Therapeutic Properties," F. A. Upshur Smith.

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"A Phytochemical Study of Hydrastis Canadensis," Ewin Gillis and H. A. Langenhan.

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Section on Practical Pharmacy and Dispensing.

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A number of new papers have been added.

"Significance of Stearin Content of Cod Liver Oil," George E. Ewe.

"Internal Phase Flavoring of Emulsions," W. Paul Briggs.

"The Melting Point of Acetylsalicylic Acid," George D. Beal and Chester R. Szalkowski.

"The Detection of Acetone in Chloroform," George D. Beal and Chester R. Szalkowski.

"Some Prescription Incompatibilities," S. L. Hilton.

"A Note on the Color of Spirit of Peppermint," W. G. Crockett and J. A. Reese.

"Acres of Diamonds in Our Own Back Yards" (*Illustrated Lecture*), Anton J. Hogstad, Jr.

"The Degree of Accuracy Which May Be Expected in Dispensing," Marvin J. Andrews.

"Tincture of Capsicum-Effect of Variations of Alcoholic Strength of Menstruum and Rate of Percolation on the Quality of the Tincture Obtained," V. L. Dickey and F. W. Nitardy.

"Tincture of Nux Vomica—Investigation of the Use of Hydrochloric Acid and Acetic Acid for Acidifying the Menstruum and the Determination of the Effect of Slow and Fast Percolation," V. L. Dickey and F. W. Nitardy.

"Relative Value of Slow and Fast Percolation in Preparing Tincture of Rhubarb and Aromatic Tincture of Rhubarb," V. L. Dickey.

"Salol Coating of Capsules," Wm. J. Husa and Louis Magid.

"Ointment of Rose Water," John C. Krantz, Jr., and C. Jelleff Carr.

"Syrup of Ferrous Iodide Made Permanent by the Addition of Citric Acid," Otto Raubenheimer.

"Dental Pharmacy" (*With an Exhibit*), George C. Schicks.

"The Alcohol Content of Syrup Tolu, U. S. P.," C. W. Ballard and Reginald Miller.

"A Direct Method for Studying the Efficiency of Enteric Tablets," E. Lozinski and G. R. Diver.

JOINT SESSION WITH THE SCIENTIFIC SECTION.

Report on the U. S. P. Revision, E. Fullerton Cook.

Report on the N. F. Revision, E. N. Gathercoal.

Report on the Recipe Book, J. Leon Lascoff.

Report of the Committee on the Ebert Prize, M. R. Thompson.

Address "Are State Associations Deteriorating?" F. J. Wulling.

"The Story of Cinchona, Including the Conquest of Malaria" (*Illustrated Lecture*), Anton Hogstad, Jr.

SECTION ON EDUCATION AND LEGISLATION.

Officers: *Chairman*, Rudolph H. Raabe, Ada, Ohio; *Vice-Chairman*, Charles W. Ballard, Mount Vernon, N. Y.; *Secretary*, C. W. Ballard, Mount Vernon, N. Y.; *Delegate to House of Delegates*, B. V. Christensen, Gainesville, Fla.

A number of additional papers have been received.

"The Scope and Content of a Course in Pharmacology for Pharmacy Students," A. Richard Bliss, Jr.

"Pharmacy Should Strive toward Parity with Medicine," F. J. Wulling.

"Publicity for Pharmaceutical Education," C. W. Ballard.

"An Education Project for Students in Pharmacy," L. M. Monell.

"The More Adequate Control of Drugs and Medicines," R. L. Swain.

"Proper Foundations for Pharmaceutical Jurisprudence," S. Kaye.

"Correlating the Assaying of Drugs with Microexamination," H. Taub.

"Controlled Apprenticeship and Pharmaceutical Legislation," Harry Bischoff.

"Standardization of Practical Drug Store Experience," Otto Raubenheimer.

"Microbiology *Versus* Bacteriology," Fanchon Hart.

"Hospital Pharmacy and the School of Pharmacy," Edward Spease.

SECTION ON COMMERCIAL INTERESTS.

Officers: *Chairman*, Rowland Jones, Gettysburg, S. Dak.; *Vice-Chairman*, Leon Monell, Buffalo, N. Y.; *Secretary*, John A. J. Funk, Galveston, Ind.; *Delegate to The House of Delegates*, J. G. Noh, Wichita, Kans.

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"Prescription Pricing," Lewis G. Freeman.

"The Commercial Aspect of the Capper-Kelly Fair Trade Act," W. Bruce Philip.

"The New Urge of Advertising," Fayetta H. Philip.

"New Aspects of the National Survey," Wroe Alderson.

"How the Drug Stores May Influence Five Million Votes This November," W. Bruce Philip.

"Educate the Pharmacists to Commercialize the Art of Pharmacy," Fayetta H. Philip.

"The Revenue Act of 1932 and the Proposed Manufacturers' Sales Tax," W. Bruce Philip.

"Merchandising the Prescription Department," G. A. Bender.

"Practical and Profitable Phases of the St. Louis Survey," J. W. Slocum.

"Fallacies in the Trend of Modern Merchandising," Fred L. Vilas.

"Association Field Work in Minnesota," Chas. V. Netz.

"Profits Plus—Film and Paper," H. S. Thomas.

"A Further Study of the Average Price Charged for Prescriptions with Their Range in Prices," Leon Monell.

"What Price Prescriptions," F. C. Felter.

SECTION ON HISTORICAL PHARMACY.

Officers: *Chairman*, J. T. Lloyd, 300 Court St., Cincinnati, Ohio; *Secretary*, Louis Gershenfeld, 43rd and Kingsessing, Philadelphia, Pa.; *Delegate to the House of Delegates*, L. E. Warren, Bureau of Chemistry, Washington, D. C.; *Historian*, E. G. Eberle, 10 W. Chase St., Baltimore, Md.

A number of additional papers have been received.

"An Unusual Mortar and Pestle," John E. Kramer.

"Animal Pharmaceuticals of the Past and Present," Charles Whitebread.

"The Mandragora," Fred B. Kilmer.

"Pioneers in American Pharmacy," J. U. Lloyd.

"American Pharmacognosists of the Nineteenth Century," Heber W. Youngken.

"Dr. Albert Schneider—A Sketch," M. A. Starkman.

"Alchemical Symbols," J. Hampton Hoch.

"Hébert, First Pharmacist in North America," Otto Raubenheimer.

"Auclair, The Apothecary in 'Shadows on the Rock,'" Otto Raubenheimer.

"Fifty Years of Prescription Ingredient Surveys," E. N. Gathercoal.

"Influence of Pharmacy on Science and Industry," Walter H. Blome.

"The Debt of American Pharmacy to Benjamin Franklin and His Protégé, John Morgan," Joseph W. England.

"The Pharmaceutical Journals of the U. S. A.," Minnie Meyer and Edward Kremers.

"A Pharmaceutical Centenary," Minnie Meyer and Edward Kremers.

"The Early Library of the Massachusetts College of Pharmacy," Edward Kremers.

"LeFaut Mourir of Jacques of 1695," Edward Kremers.

"Phytochemical Literature," Edward Kremers.

"Phytochemical Terminology," Edward Kremers and co-laborers.

"An Aspect of the Evolution of Our Pharmaceutical College Libraries," Edward Kremers.

"History of Hamamelis, Including Its Relation to the Distillate First Known as Pond's Extract," John Uri Lloyd and John T. Lloyd.

"Stereopticon Slides Representing Old Mortars," John T. Lloyd.

"Hashish and the Assassins," Leo Suppan.

"Peyote, the Divine Plant of Certain Indian Tribes," J. U. Lloyd.

"An Interesting Collection of Drug Jars," Charles H. LaWall and Millicent R. LaWall.

"Pioneering in Phytochemistry," Arno Viehoever.

"A Short Historical Sketch of the Canadian Pharmaceutical Association and the Canadian Colleges of Pharmacy," G. A. Burbidge.

"A Brief History of the Colorado Pharmacal Association," Charles J. Clayton.

"A Brief History of the Virginia Pharmaceutical Association," A. L. I. Winne.

"A History of the Maryland Pharmaceutical Association," E. F. Kelly.

"Rho Chi 1922–1932," Glenn L. Jenkins.

"A Brief History of the District of Columbia Retail Druggists' Association," Augustus C. Taylor.

"A Brief Historical Sketch of the Kentucky Pharmaceutical Association," J. W. Gayle.

"History of the Alabama Pharmaceutical Association," W. E. Bingham.

"A Brief Résumé of Arkansas Pharmaceutical Association," Mary A. Fein.

CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES.

Officers: *President*, Charles J. Clayton, Denver, Colo.; *First Vice-President*, Walter D. Adams, Forney, Texas; *Second Vice-President*, J. W. Slocum, Indianola, Iowa; *Secretary-Treasurer*, Carl J. A. Harring, Newton Center, Mass. *Executive Committee:* P. J. Garvin, New Haven, Conn.; J. W. Slocum, Indianola, Ia.; Robert C. Wilson, Athens, Ga.; Rowland Jones, Gettysburg, S. Dak.; W. Bruce Philip, San Francisco, Calif.

ROUND TABLE DISCUSSIONS.

"Revenue Act of 1932 and Suggested Manufacturers' Sales Tax That Will Come Up

in Next Session of Congress," Introduced by W. Bruce Philip.

"The Importance of County District Meetings," Introduced by Robert Turrell.

"Distributors' Defence Movement," Introduced by Milton Malakoff.

"Allocation of Advertising in Trade Journals"—A Tentative Plan, Walter D. Adams.

"Limitations of Secretaries' Activities," Introduced by Carl Harring.

FOURTH ANNUAL MEETING OF THE CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS.

Officers: *Chairman*, R. L. Swain, 2411 N. Charles St., Baltimore, Md.; *Secretary*, M. N. Ford, 608 High-Long Building, Columbus, Ohio.

ADDRESSES AND ROUND TABLE DISCUSSIONS.

"Discussion of Recent Pharmaceutical Legislation," M. N. Ford, Ohio.

"Recent Pharmaceutical Legislation in New Jersey," Robert P. Fischelis, New Jersey.

"The Recent California Case Upholding the Pharmacy Law," John Culley, California, W. Bruce Philip, Washington.

"A Review of the Operation of the Pennsylvania Pharmacy Law in 1931," John M. Woodside, Pennsylvania.

"The Enforcement of the Illinois Pharmacy Act."

"Collaboration between State and Federal Agencies in the Enforcement of Narcotic Laws," A. L. Tennyson, Legal Advisor and H. J. Nugent, Field Supervisor, Federal Narcotics Bureau.

NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH.

Officers: *Chairman*, E. N. Gathercoal, Chicago; *Vice-Chairman*, William J. Husa, Gainesville, Fla.; *Secretary*, John C. Krantz, Jr., Baltimore; *Treasurer*, Fitzgerald Dunning, Baltimore.

First Session, 9.30 A.M.

1. Call to Order by Chairman.
2. Appointment of Nominating Committee.
3. Summary of Year's Activities and Outlook Conference for the Future, by Chairman of Gathercoal.
4. Reports of Officers.
   a. Report of Secretary.
   b. Report of Treasurer.
   c. Report of Executive Committee by Secretary.
5. Reports of Standing Committees.
   (1) Pharmaceutical Dispensing, W. J. Husa, *Chairman*.
   (2) Manufacturing Pharmacy, E. F. Cook, *Chairman*.
   (3) Medicinal Chemicals, George D. Beal, *Chairman*.
   (4) Pharmacognosy, H. W. Youngken, *Chairman*.
6. Roll Call of Delegates.
7. Report of Special Committee on Means of Stimulating Research, E. N. Gathercoal, *Chairman*.
   a. The announcement of the first award of the Fellowship of the National Conference on Pharmaceutical Research.
8. Adjournment for luncheon. Arrangements will be made for an assembled luncheon for the delegates.
   An address pertinent to the work of the Conference will be delivered.
   "Ten Years of the Research Conference," H. V. Arny.

Afternoon Session, 2.00 P.M.

9. (5) Pharmacology and Bioassays, J. C. Munch, *Chairman*.
   (6) Bacteriology and Biologicals, A. R. Bliss, *Chairman*.
   (7) Pharmaceutical Physics, C. B. Jordan, *Chairman*.
   (8) Pharmaceutical Education, A. B. Lemon, *Chairman*.
   (9) Pharmaceutical Economics, Ambrose Hunsberger, *Chairman*.
   (10) Historical Pharmacy, C. H. LaWall, *Chairman*.
10. Reports of other Special Committees.
    (1) Book on Research Achievements, John C. Krantz, Jr.
    (2) Census of Research, J. C. Munch, *Chairman*.
11. General Discussion of the Status of Pharmaceutical Research.
12. Election and Installation of Officers.
13. Adjournment.

JOHN C. KRANTZ, JR., *Secretary*.

TENTH ANNUAL SESSION OF PLANT SCIENCE SEMINAR, AUGUST 15–19, 1932.

Officers: *Chairman*, E. B. Fischer, 4921 S. Fremont St., Minneapolis, Minn.; *Secretary-Treasurer*, O. P. M. Canis, Ozone Park, L. I., N. Y.

Monday, August 15th.

10:00 A.M. Greetings and Registration.

11:00 A.M. Address of Welcome, Dean Heebner, Toronto University.
12:00 NOON. Introduction of Members and Delegates.
Luncheon.
2:00 P.M. Chairman's Address.
2:30 P.M. Committee Report on Medicinal Plant Cultivation, B. V. Christensen.
3:30 P.M. Inspection of University of Toronto Campus, Hart House, etc.
8:00 P.M. Historical Report of activities of Plant Science Seminar.
9:00 P.M. Purpose of the Seminar, E. L. Newcomb.

Tuesday, August 16th.

9:30 A.M. Problems in Quantitative Microscopic Research, Practical Demonstrations, followed by Round Table Talk and Discussion, H. W. Youngken.
12:00 NOON. Luncheon.
2:00 P.M. Discussion of Outline of Four-Year Syllabus of Pharmacognosy, Dr. B. V. Christensen.
3:30 P.M. Trip around Toronto Harbor and City of Toronto.
8:00 P.M. Illustrated Lecture on Paper Pulp Industry, T. Linsay Crossley, University of Toronto.
9:00 P.M. Coptis Occidentalis Salisb. (Ranunculaceæ), C. E. Mollett.

Wednesday, August 17th.

9:30 A.M. Mint Symposium Program under direction of Dr. Bacon.
11:00 A.M. Chrysanthem. Balsamita, E. B. Fischer and Ralph Voigt.
12:00 NOON. Luncheon.
2:00 P.M. Botanical Excursion to Bog under direction of Prof. Sifton, University of Toronto.
8:00 P.M. A Trip to Egypt in Search of a New Drug (*Illustrated Lecture*), Upsher Smith.
9:00 P.M. The Plant Science Seminar at Play and at Work (the latest "Sound-Proof" Moving Picture Product of D. A. R. Baker, Moving Picture Incorporation Pizberg-Holly, under personal supervision of Director D. A. R. Baker).

Thursday, August 18th.

All Day Botanizing Trip to Vineland and the Provincial Reserve at Niagara Falls, Ontario. Picnic Dinner and "Easy Ride" Back to Toronto. Social Evening.

Friday, August 19th.

9:30 A.M. Business Meeting.
Report of Secretary-Treasurer.
Report of Commission on By-Laws.
Appointment of Committees.
Election of Officers.
12:00 NOON. Luncheon.
Afternoon Left for Packing of Specimens, etc.

STATE ASSOCIATION MEETINGS.

Reports on some of the State Associations were made in the June JOURNAL and additional items are added in this number. Other reports will be made in succeeding numbers for which the JOURNAL will welcome reports and photographs and lists of officers.

A number of reports had to be omitted and will follow in next issue.

ARKANSAS PHARMACEUTICAL ASSOCIATION.

Miss Mary A. Fein prepared a comprehensive résumé of Arkansas Association history, dealing with the events of that organization and sketches of the presidents during its fifty years of activity. It is interesting to note that the 50th anniversary was held at Hot Springs and that Hot Springs is celebrating its one hundredth anniversary year.

COLORADO PHARMACEUTICAL ASSOCIATION.

Colorado Pharmaceutical Association elected the following officers for the ensuing year: *President*, Victor N. Lagerquist, La Junta; *First Vice-President*, Harold A. Parkison, Glenwood Springs; *Second Vice-President*, Sebastian Kletzky, Pueblo; *Treasurer*, Julius F. Earnest, Denver; *Secretary*, Chas. J. Clayton, Denver; *Member Executive Committee*, Wm. C. Alexander, Salida.

The executive committee consists of the foregoing five officers and one elected member, and the retiring president who is David B. Frey of Colorado Springs; Mr. Julius F. Earnest of Denver was elected chairman of the executive committee.

Among the resolutions adopted are the following: Protesting the abolishment or

crippling of the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Condemning misuse of the word "drugs" when dope or narcotics are meant. Endorsing Pharmacy Week and urging its observance. Endorsing Fair Trade Legislation and especially, the Capper-Kelly Bill. Urging education of the public to the menace of price cutting and calling on the N. A. R. D. to institute a campaign for that purpose. Endorsing a State Fair-Trade Act or Junior Capper-Kelly law. Endorsing an Anti-Discrimination Act, prohibiting operators of chain stores from selling at lower prices in some units than in others, if for the purpose of injuring or destroying competition. Suggesting an Alliance of Retail Trade Associations. Endorsing the "Patronize Home Industry" movement. Endorsing the "Buy It in This Market" movement. Endorsing Monte L. Powell, Second Vice-President of the N. A. R. D., for advancement in office in that organization.

FLORIDA PHARMACEUTICAL ASSOCIATION.

Florida Pharmaceutical Association held its annual meeting at Orlando, June 14th–16th. The following officers were elected for the ensuing year: *President*, A. P. Purcell, Tampa; *First Vice-President*, Laurie J. Taylor, Eustis; *Second Vice-President*, J. N. McElroy, Orlando; *Third Vice-President*, A. Finstad, Miami. J. W. Hunter brought greetings of the National Wholesale Druggists' Association; President John W. Dargavel, for the National Association of Retail Druggists, and gave a résumé of the work of this organization. Dr. James H. Beal brought greetings from the AMERICAN PHARMACEUTICAL ASSOCIATION and presented a paper, "Place and Purpose of the A. PH. A. among Pharmaceutical Organizations," which is published in this issue of the JOURNAL.

President J. H. Haughton, in his annual address, summarized the Association's activities. He advocated a new pharmacy law. Secretary Grommett reported a definite plan for raising funds for legislative purposes. Secretary J. H. Haughton made a report for the Florida State Board of Pharmacy and the report of the State Pharmacy Inspector was made by M. H. Doss. During a discussion the question came up—inquiring why the control of the state inspection service had passed from the Board of Pharmacy to the Board of Health. It was stated that this was due to the fact that the Board of Pharmacy did not have adequate power or funds and was not an enforcing body.

A paper by Dr. Wm. J. Husa of the University of Florida was read by Mr. Taylor of Eustis on ophthalmic ointments, enteric coating of capsules, incompatibilities, emulsions, sterilization, solutions and the accuracy of dispensing—embodied in a paper, entitled—"Recent Advances in Prescription Work."

A Report was made by Dean Townes R. Leigh on "The Progress of the College of Pharmacy." A paper on "Passing Laws" was presented by Richard S. Johnson and discussed by Dr. James H. Beal and others. A paper on "Psyllium Seed in Medicine" was presented by E. N. Mallory and read by Dean Mollett of the University of Montana. A number of other papers were read and discussed. The attendance was good and accounted for by the interest developed through the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in Miami last year.

Among the resolutions were the following: "Provisions for Making the Legislative Committee More Effective." "Bringing the N. A. R. D. to St. Petersburg."

IDAHO PHARMACEUTICAL ASSOCIATION.

Idaho Association held a joint meeting with the Washington Association at Hayden Lake. The following officers were elected: *President*, H. Thoreson, Hazelton; *First Vice-President*, Elmer B. Williams, Boyce; *Second Vice-President*, J. B. Ostrander, Wallace; *Secretary-Treasurer*, Herschel M. Cummins, Boyce.

President Woodcock in his address discussed state legislation, the St. Louis Survey, Capper-Kelly Bill, and the Idaho School of Pharmacy. Secretary Herschel M. Cummins reported that the cash balance of the Association was considerably above that of last year. The prescription pricing schedule by Mr. Felter was endorsed.

KENTUCKY PHARMACEUTICAL ASSOCIATION.

O. L. Dyer of Burnside was elected *President* of Kentucky Pharmaceutical Association; Secretary J. W. Gayle and Treasurer William J. Johnston were reëlected to their respective offices. The registration was the largest in the history of the association and the program interesting and profitable. Among the speak-

ers were Dr. F. J. Blackerby, of the State Board of Health, and F. H. Kirby, of Chicago.

Hon. Clyde Kelly was commended for his work by resolution; favorable action was also taken on a resolution to bring back the show globe. Crab Orchard Springs will again be the meeting place in 1933.

MARYLAND PHARMACEUTICAL ASSOCIATION RESOLUTIONS.

Among the resolutions adopted at the Golden Anniversary meeting held at Ocean City, were the following: Relating to the appointment of delegates to the AMERICAN PHARMACEUTICAL ASSOCIATION, and the National Association of Retail Druggists. That provisions be made in the program of the sectional meetings of the State Association for a joint session of physicians and pharmacists whenever feasible. Provision for a suitable memorial to Robert J. Ruth. Continued affiliations with the Drug Trade Bureau of Public Information and the Retail Druggists Association. That the AMERICAN PHARMACEUTICAL ASSOCIATION continue its efforts and work to increase the representation of pharmacists in Government service. Endorsement of the Capper-Kelly Bill. Endorsement of the Army Corps Bill and urging renewed efforts in its behalf by the AMERICAN PHARMACEUTICAL ASSOCIATION. That the State Board of Pharmacy study the subjects which may be added in the four-year curriculum. That the Health Departments study the distribution of biologicals furnished free of charge. That the Association establish a scholarship at the School of Pharmacy carrying an annual contribution of $250.00, for a systematic study of problems relating to manufacture, compounding and distribution of drugs and medicine. That the Association support the request for state appropriation of $25,000 annually for the school of pharmacy. That the Maryland Association express its belief in drug store experience, but that the requirements be restricted to one calendar year. That various organizations, national and state, coöperate in establishing this standard so that registration may be definite and uniform. Tributes were paid in resolutions in memory of H. Lionel Meredith; Mrs. Nora H. Henry; Wm. R. Ely. Recommendation was given to the Travelers Association in a resolution of thanks. Thanks were also extended to the hotel and press. Expressions of regard and esteem to Governor Albert C. Ritchie.

The following officers were elected for the ensuing year: *President*, L. M. Kantner, Baltimore; *First Vice-President*, L. Vernon Johnson, St. Michaels; *Second Vice-President*, Andrew F. Ludwig, Baltimore; *Third Vice-President*, Charles D. Routzahn, Mount Airy; *Secretary*, E. F. Kelly, Baltimore; *Treasurer*, Harry S. Harrison, Baltimore; *Editor Maryland Pharmacist*, Robert L. Swain, Baltimore.

The Traveling Auxiliary (T. A. M. P. A.) contributed largely to the entertainment by its Minstrel Show and part in the banquet features. The program was covered in gold and contained information relative to Maryland Association history, etc. The souvenir folder (in silver) on the silver service presentation contained a picture of Secretary Kelly as frontispiece and a sketch. References to this meeting are made elsewhere in this issue of the JOURNAL, also in June number.

MISSISSIPPI PHARMACEUTICAL ASSOCIATION.

The 49th annual meeting of Mississippi Pharmaceutical Association was held in Natchez; the Golden Anniversary Meeting will be held in Jackson, next year. The officers elected for the ensuing year are: *President*, H. B. McInnis, Lumberton; *First Vice-President*, B. C. Roberts, Greenwood; *Second Vice-President*, Lew Wallace, Laurel; *Secretary-Treasurer*, B. B. Key, Jackson. Secretary A. S. Coody resigned from office, being unable to attend the convention, and Claude E. Anding, *Business Manager* of the Association, announced his retirement from office. He endorsed the proposal to combine the functions of *Business Manager* and *Secretary*.

Chairman S. B. Key reported on legislative matters. He referred to a number of provisions relating to the pharmacy law, among them several items relating to display and designation of a pharmacy, and the powers of the State Board of Pharmacy. He also made reference to the removal of several tax items in which the druggist is concerned. Prof. Anton Hogstad delivered an illustrated address on "The Changing Order of American Pharmacy" which was well received. Dean E. L. Hammond of the School of Pharmacy, submitted a comparative table of costs on several N. F. items.

Among the resolutions adopted was endorsement of the new form of calendar. It was recommended to reduce the annual fees of $10.00.

MISSOURI PHARMACEUTICAL ASSOCIATION.

Missouri Pharmaceutical Association held its meeting in Joplin and elected the following officers: *Honorary President*, C. W. Hutchason; *President*, B. J. Spaeth, St. Louis; *First Vice-President*, Joseph Knight, Lebanon; *Second Vice-President*, G. C. Egy, Kansas City; *Third Vice-President*, John Emerson, Joplin; *Treasurer*, Murray Q. Williams, Warrensburg; *Secretary*, W. H. Lamont, St. Louis; *Historian*, Ambrose Meuller, Webster Groves. Karl F. G. Meyer, in his address before the convention stated that the drug industry was affected less by the depression than any of the major industries in the United States.

Secretary Samuel C. Henry of the N. A. R. D. discussed the present tax bill. Quite a number of veterans attended the annual dinner, at which time regret was expressed because of the decease of one of its best known members, Theodore F. Hagenow.

NEW JERSEY PHARMACEUTICAL ASSOCIATION.

New Jersey Pharmaceutical Association elected the following officers at its meeting in Atlantic City: *President*, Henry D. Kehr, Trenton; *First Vice-President*, Dunham S. Beldon, Newark; *Second Vice-President*, Hugo Krause, Atlantic City; *Secretary*, Prescott R. Loveland, Atlantic City; *Treasurer*, Charles J. McCloskey, Culver Lake.

A resolution was adopted expressing interest in the survey work of the Department of Commerce. Among the recommendations of President Chamberlain, approval was given to promotion of National Pharmacy Week and offering a state prize for the best Pharmacy Week window. The *New Jersey Journal of Pharmacy* is to be continued. The members were urged to use every effort in the advancement of the professional side of pharmacy. The prize awarding $25.00 in gold to the highest ranking students in the New Jersey College of Pharmacy was continued. It was approved that next year's meeting be held in connection with New York State Pharmaceutical Association on board an ocean liner during a four-day cruise, if possible.

The session devoted to the reading and discussion of papers was directed by Dr. Earnest Little. Among these were discussions of—"New Remedies," by Dr. H. V. Arny; "Methods of Detailing Physicians and Dentists," by Dr. George C. Schicks. Robert W. Rodman spoke on "The National Drug Store Survey," and Adolph Marquier spoke on "Commercial Pharmacy." Among others, W. Bruce Philip was a speaker of the convention.

The New Jersey Board of Pharmacy has published in a pamphlet the pharmacy laws of the state of New Jersey. One of these laws provides for the discontinuance or the lessening of Assistant Pharmacists. It is provided in each 126 of the laws of 1932 making it unlawful to use designations for a drug store or pharmacy, unless the place of business is a drug store or pharmacy, operated or managed at all times by a registered pharmacist.

NEW YORK PHARMACEUTICAL ASSOCIATION.

The Committee on Pharmaceutical Economics of the New York State Pharmaceutical Association, Leon Monell, Chairman, rendered a very interesting report at the Saratoga Springs meeting of the New York Pharmaceutical Association. The report was based on questionnaires sent to 6359 drug stores; there were 649 returns of which 625 were used in making up the report. The compiled data have been made up according to the size of cities in groups. The first group applying to towns of 5000 or less population; the second group up to 25,000; the third up to 100,000; the fourth, 600,000; and reports on others, were included in group five.

Commissioner J. M. Doran was one of the speakers before the New York State Pharmaceutical Association. We quote from the address: "That while commercial matters must always have the attention of the pharmacist, nevertheless the professional and ethical background should never be obscured in the sometimes more pressing commercial discussions.

"The community relies more on the pharmacist and the drug store than it realizes, for this constant service in dispensing medicinal products goes on quietly and without interruption, and too little credit is given by the community to the faithful pharmacist upon whose knowledge, skill and attention to the smallest detail so much may depend. In a peculiar sense the pharmacists' activities affect the home life of all of us.

"The astonishing thing to me has always been that the pharmacist and druggist attending to so many details, surrounded by so many laws and regulations requiring meticulous care to insure their complete observance, is able to

devote any considerable part of his time and energy to serving the community in the essential matter of public health. But yet, in spite of all his detailed burdens, he stands out as a man faithful in his civic duties and always available with his necessary services."

NORTH CAROLINA PHARMACEUTICAL ASSOCIATION.

North Carolina Pharmaceutical Association met at High Point, 436 being registered at the convention; among the speakers were Dr. W. G. Crockett, Dr. Anton Hogstad, Jr., Carl Weeks, E. C. Brokmeyer.

I. W. Rose presented a valuable report on "Practical Pharmacy and Dispensing," and a committee was named to acquaint the doctors and dentists with U. S. P. and N. F. preparations.

John A. Goode of Asheville was endorsed for the presidency of the N. A. R. D. President Polk C. Gray was prevented from attending the convention on account of illness and the members were grieved to hear of his death prior to the close of the meeting.

The following were named for election to the offices for 1933–1934, by mail ballot: *President*, W. C. Ferrell, Nashville, and John C. Hood, Kingston; *First Vice-President*, D. L. Boone, Durham, and R. A. McDuffie, Greensboro; *Second Vice-President*, E. F. Rimmer, Charlotte, and E. J. Suttlemyre, Hickory; *Third Vice-President*, P. D. Dissett, Wilson, and C. E. Matthews, Jr., Roanoke Rapids; *Secretary-Treasurer*, J. G. Beard, Chapel Hill, and C. L. Eubanks, Chapel Hill. Executive Committee, I. W. Rose, Chapel Hill, and S. E. Welfare, Winston-Salem.

The 1933 meeting will be held in Charlotte.

SOUTH CAROLINA ASSOCIATION.

Brief notice was given in the June JOURNAL. The following officers were elected for the ensuing year: *President*, James G. Halford, Johnston; *First Vice-President*, Herbert Wannamaker, Cheraw; *Second Vice-President*, J. G. DeLorme, Sumter; *Third Vice-President*, George Keller, Union; *Secretary-Treasurer*, Frank M. Smith, Charleston; this is the 33rd year of his office. R. M. Dacus, Greenville, was elected delegate to the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in Toronto. Dean E. T. Motley spoke on behalf of the School of Pharmacy of the University of South Carolina.

SOUTH DAKOTA PHARMACEUTICAL ASSOCIATION.

South Dakota Pharmaceutical Association, at its Aberdeen meeting, elected the following officers for the ensuing year: *President*, E. C. Thompson, Colton; *Vice-President*, in charge of Scientific and Practical Section, Bliss Wilton, Letcher; *Vice-President*, in charge of Education and Legislation Section, J. J. McKay, Pierre; *Secretary*, Rowland Jones, Gettysburg; *Treasurer*, Frank Bockhoven, Clark.

President Otto J. Tommeraason, in his address, gave a summary of the activities of the Association; he commended the work of F. L. Briggs of the State Board of Pharmacy in the enforcement of pharmacy laws relating to the protection of public health. He also gave consideration to the relations between physicians and pharmacists and recommended that the Professional Relations Committee be continued. He recommended also the establishment of Scientific and Practical Pharmacy sections following the plans of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Among the resolutions adopted Price Maintenance was favored. The work of the Department of Pharmacy and of Dean Searles was commended. It was decided to continue the convention plan of holding three half-day business sessions and devoting the afternoons to entertainments.

UTAH PHARMACEUTICAL ASSOCIATION.

Utah Pharmaceutical Association convened at Ogden, June 23rd–24th. Salt Lake was chosen for the 1933 meeting and the following officers were elected: *President*, G. D. Charlier, Sandy; *First Vice-President*, Wilford L. Anderson, Wellsville; *Second Vice-President*, John A. Booth, Spanish Fork; George F. Flashman, Salt Lake; *Treasurer*, Eugene L. Wade, Salt Lake.

The Association went on record in favor of the repeal of the 18th amendment. It was considered that the Utah dry law is sufficient to prevent liquor being put back into the drug stores, which no one wanted. A movement by John A. Booth to bring pharmacy back into the University of Utah as a regular course of instruction was supported. The St. Louis Survey was discussed.

John Culley presented a paper on "The Development of Our Modern Materia Medica."

President Clark discussed "Professional Pharmacy," "The Doctor of Pharmacy Degree," "Prescription Pricing," "Legislation to Protect Pharmacy," "Fair Price Legislation," and the "St. Louis Survey." It was agreed that Secretary Flashman should represent the Association in the Conference of Pharmaceutical Association Secretaries at Toronto. The *Secretary-Treasurer* presented an encouraging report.

Following the general discussion it was decided that the consensus of opinion was—that retailers should pass the taxes on to the consumers wherever and whenever possible. The prescription pricing method presented by F. C. Felter was approved.

VIRGINIA PHARMACEUTICAL ASSOCIATION.

Virginia Pharmaceutical Association elected the following officers: *Honorary President*, W. T. Reeves, South Boston; *President*, Walter S. Nicklin, Alexandria; *Vice-Presidents*, E. P. Berlin, Berryville; Guy L. Miller, Charlottesville; H. S. Falconer, Newport News; James M. Lee, Danville; J. C. Kearfoot, Martinsville; E. B. Greevor, Chilhowie; *Secretary-Treasurer*, A. L. I. Winne, Richmond.

The meeting was held in conjunction with that of West Virginia Association at White Sulphur Springs. Among the speakers of the convention were: Dr. Warren F. Draper, Health Commissioner of Virginia; Mrs. W. Bruce Philip, Washington, D. C.; H. C. Christensen, Secretary N. A. B. P.; A. B. Brooks, Wheeling, W. Va.; Dr. W. G. Crockett; Dean W. F. Rudd, Dr. James H. Beal, Chairman Board of Trustees, U. S. P., Ft. Walton, Florida; Harry S. Noel, Indianapolis; G. W. Darnell, Norfolk.

The Virginia Association adopted the following resolution:

Resolved, That the Virginia Pharmaceutical Association, in convention assembled, goes on record as requesting manufacturers who are still overpricing their goods, in many instances retaining wartime prices, when the costs of materials are the lowest in many years, to give consideration to lowering the wholesale prices of their goods to the 2–4–8 basis, or lower.

Other associations are asked to support this effort.

We are advised of the death of our fellow-member, William S. Alfriend, of Petersburg, Va.

The 1933 convention will be held the latter part of June at the New Chamberlain Hotel, Old Point Comfort, Virginia.

WASHINGTON STATE PHARMACEUTICAL ASSOCIATION.

The Washington State Pharmaceutical Association and Idaho Association held joint meetings; the business sessions, however, were held at Spokane on June 27th. The officers were *reëlected* for the ensuing year. It seems that a similar plan will be adopted for next year's convention. There were no business transactions scheduled for the meeting at Hayden Lake; the members assembled for the purpose of listening to prominent speakers; among them, President John W. Dargavel of the National Association Retail Druggists and Carl Weeks. Prescription Pricing was discussed and the plan of Editor Felter received favorable consideration. The address of President Bracking dealt with price-cutting and present conditions; prescription problems were also discussed. Dean C. W. Johnson and Dean P. H. Dirstine rendered interesting reports relative to the respective pharmacy schools.

WEST VIRGINIA PHARMACEUTICAL ASSOCIATION CONVENTION.

The joint convention of the Virginia and West Virginia Pharmaceutical Associations held at the Greenbrier Hotel, White Sulphur Springs, W. Va., June 20th–22nd, was successful in every way. In order that the individuality of each group would not be lost, separate sessions were held in the mornings, during which the various reports and problems peculiar to each group were read and discussed.

The West Virginia group discussed "Should the Druggist Feature and Sell Unprofitable Merchandise?" Arch Krieg, of Charleston, led the discussion from the retail standpoint, Ben Exley from the wholesale standpoint, followed by Mr. H. S. Noel who discussed the subject from several angles. Another subject was "What Can Be Done to Increase the Druggists' Income?" The subject was discussed under several heads among them "Increasing the Income on Prescriptions" was presented by Prof. J. Lester Hayman. These discussions were most helpful and many points were brought out which if followed would surely increase the income of the druggist. The third session of the West Virginians was devoted mostly to legislative matters and the election of officers for the following year. The Association will sponsor legislation requiring the registration of drug stores annually with the State Board of Pharmacy.

The Virginians and West Virginians met in joint sessions during the afternoons at which time the following speakers appeared on the program: Dr. Warren F. Draper, Health Commissioner of Virginia, "The Public Health Program in Relation to the Pharmacist;" Mrs. W. Bruce Philip, "Ask Your Wife," and "Legislation of Interest to Pharmacy before the Seventy-Second Congress;" Secretary H. C. Christensen, "Reciprocity and Its Benefits to Pharmacy;" A. B. Brooks, "An Empire of Natural Wonder;" Dean W. F. Rudd, "Pharmaceutical Education;" Dr. James H. Beal, "Pharmacy;" H. S. Noel, "Keeping Pace with Modern Pharmacy;" and Frederick W. Darnell, "Résumé of the St. Louis Drug Store Survey."

The officers elected for the ensuing year are: *President*, W. R. Crane, Fairmont; *First Vice-President*, C. W. Collins, Parkersburg; *Second Vice-President*, R. D. Hankle, Bluefield; *Third Vice-President*, John A. Greear, Huntington; *Council Member*, Arch Krieg, Charleston; *Secretary-Treasurer*, J. Lester Hayman, Morgantown.

The twenty-seventh annual meeting will be held in Clarksburg in June 1933.

WYOMING PHARMACEUTICAL ASSOCIATION.

Wyoming Pharmaceutical Association held its annual session at Lander, June 20th–21st, and this meeting was acclaimed to be the most successful and important one in a number of years. Amendments were proposed to provide for the registration of apprentices, also amendments for strengthening the pharmacy law so as to put into effect the requirements for reciprocity.

The following officers were elected for the ensuing year: *President*, F. G. Huffman, Wheatland; *First Vice-President*, Tarvin Hoops, Powell; *Second Vice-President*, George Arnold, Thermopolis; *Secretary-Treasurer*, John Tripenny, Casper. A. E. Roedel, Harry Prahl, D. M. Killam and Dale Kilburn, were placed in nomination for the State Board of Pharmacy.

Resolutions were adopted protesting against the retirement of 2000 army officers on three-fourths pay and steps were taken to promote publicity for these resolutions. Further resolutions commended the Bureau of Foreign and Domestic Commerce for its service to the drug trade of Wyoming and to all other business interests and protesting against crippling of this essential service organization.

CERTIFICATES OF REGISTRATION AWARDED IN NEW JERSEY.

Governor A. Harry Moore awarded certificates of registration to seventy-eight newly registered pharmacists at the State House in Trenton, June 28th. The ceremonies incident to the award of certificates were presided over by President Dean B. Crawford of the New Jersey Board of Pharmacy and were participated in by all officers and members of the Board and President Henry D. Kehr of the New Jersey Pharmaceutical Association.

Mr. Crawford, in his introductory remarks dwelled on the responsibilities about to be conferred on the new registrants, and urged them to assume these responsibilities with credit to their calling.

Vice-President C. Graham McCloskey of the Board in a brief address called attention to the origin of the New Jersey Pharmaceutical Association, and introduced President Henry D. Kehr, who welcomed the new registrants into the ranks of pharmacists of the state and urged them to take an active part in the upbuilding of their profession by joining the New Jersey Pharmaceutical Association.

Secretary Robert P. Fischelis, of the Board, then gave an outline of the provisions of the laws governing the practice of pharmacy in the state of New Jersey, and his remarks were followed by the reading of the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION by the three other members of the Board of Pharmacy. Treasurer Albert J. Smith, of the Board, read Chapter I. W. Scott Taylor read Chapter II, and James J. A. Bauman read Chapter III. The Code of Ethics was then signed by each registrant.

Governor Moore in awarding the certificates of registration to each registrant in person, congratulated them on having achieved the goal in their effort to become licensed pharmacists, and complimented the Board of Pharmacy on the efficient manner in which it is conducting its work.

THE REVENUE ACT OF 1932.

We are taking the liberty of reprinting part of an editorial on the Revenue Act of 1932 by W. Bruce Philip in the *N. A. R. D. Journal* of July 7th.

"The Revenue Act of 1932 has been effective since the 21st day of June, 1932. The most important questions that seem to be agitating the retail druggist is when and how he shall

advance the retail price of toilet preparations, and what are the articles taxed?

"Competition may be a controlling factor, because during hard times the average citizen is forced to watch prices closely, and is apt to trade at the store where prices are lowest.

"When the tax bill was considered the majority of the members of congress expressed the opinion that it was expected that the tax would be passed on to the consumer. Where the manufacturer passes the tax on to him, every independent retail druggist has a right to pass this tax on to the consumer by increasing his retail selling price the amount of the tax.

"In 1934 when the special manufacturer's sales tax is expected to be removed, merchandise on hand (tax paid) will then be in competition with merchandise that can be bought tax free. This loss can in a measure be offset by raising prices on stock now on hand.

"Any druggist may change a price to whatever price he pleases at any date, but inasmuch as it is a federal misdemeanor to misrepresent the selling price as including the tax when it does not, druggists should be doubly careful in advertising or making statements explaining changes in prices covering stock on hand. As to these goods—stock on hand—the druggist positively, definitely, absolutely must not say 'my price includes the tax.'"

"Section 1123 (Revenue Act of 1926): Whoever in connection with the sale or lease, or offer for sale or lease, of any article, or for the purpose of making such sale or lease, *makes any statement, written or oral, (1) Intended or calculated to lead any person to believe that any part of the price at which such article is sold or leased, or offered for sale or lease, consists of a tax imposed under the authority of the United States,* or, (2) ascribing a particular part of such price to tax imposed under the authority of the United States, knowing that such statement is false or that the tax is not so great as the portion of such price ascribed to such tax, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than $1000 or by imprisonment not exceeding one year, or both."

International Standards.—The June 1932 issue of the *Bulletin de la Fédération Internationale Pharmaceutique* carries the report of the International Commission on Proprietary Remedies for 1932. The preface of this report was elaborated by a special sub-committee and contains descriptions of a number of general and specific methods for the analysis of the newer synthetics. The preface bears the date of July 1931 as most of the work of the committee was done under the direction of Prof. H. Thoms, since deceased. The present chairman of the committee is Prof. L. van Itallie.

The report contains much which should be of interest to American pharmacists at this time as our two official drug standards, the Pharmacopœia of the United States and the National Formulary, are in the midst of another revision. It should be of special interest to those engaged in analytical work as coöperation in perfecting the proposed methods is invited. The purpose of the Federation is to develop methods of analysis which may universally be adopted for standardization and thus bring about world-wide uniformity in these products.

The following are the procedures and subjects covered by the report: Determination of specific gravity, melting point, congealing point, boiling point, optical activity, viscosity; general tests for purity; definition of opalescence, weakly opalescent, neutral, acid and basic; determination of moisture, ash, alcohol; volumetric solutions; buffer solutions for hydrogen-ion determinations; indicators for hydrogen-ion determinations; colorimetric measurement of hydrogen-ion concentration of solutions; macro- and micro-Kjeldahl methods for the determination of nitrogen; estimation of arsenic; determination of phosphorus in organic combination; determination of iron in iron preparations; analysis of tablets; quantitative determination of alkaloids; determination of morphine in aqueous solutions; determination of morphine in mixtures of the opium alkaloids (pantopon, etc.).—A. G. DuMez.

New York Pharmaceutical Association elected the following officers for the ensuing year: *President*, Harry H. Miller, New Rochelle; *First Vice-President*, John F. O'Brien, Rochester; *Second Vice-President*, John Scavo, New York City; *Third Vice-President*, E. J. Hansen, Buffalo; *Secretary*, E. F. Dawson, Syracuse; *Treasurer*, R. A. Austin, Cairo.

Indiana Pharmaceutical Association elected the following officers: *President*, Francis Britt, Evansville; *First Vice-President*, L. G. Kramer, Michigan City; *Second Vice-President*, Robert J. Dougherty, South Bend; *Secretary*, F. V. McCullough, 501 Elsby Building, New Albany; *Treasurer*, Joseph W. Weis, Hammond.